MIDWAY

October 1993
16-44029-101

MORTAL KOMBAT II KIT

OPERATIONS MANUAL

Installation & Operation • Testing & Problem Diagnosis
Parts Information • Wiring Diagrams & Schematics

MORTAL KOMBAT II
Instructions

Insert Coin(s)

In a two player game, the loser pays and the winner stays.

Press the Punch and Kick buttons to attack an opponent.

Use the joystick to make the screen player jump or duck, and move left or right.

Use joystick and button combinations to discover secret moves.

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MORTAL KOMBAT II
KIT

MORTAL KOMBAT II
KIT

SECTION
one

Operation & Installation

Safety Notices

The following safety hints apply to all kit operators and service personnel. Specific warnings and cautions will be found throughout this manual where they apply. We recommend that you read this page, and also all of Section 1, before preparing your kit for play.

⚠ CAUTION

Notice: Salvaged Parts

Parts salvaged from old games are required to complete your kit. These salvaged parts must operate perfectly: otherwise, the converted game cannot perform properly or safely. Always repair circuit board malfunctions and cabinet damage before conversion is attempted.

Notice: Power Supply

Be sure the power supply from your old game is capable of +5V dc at 5A, -5V dc at 1A and +12V at 2A. These operating voltages are necessary for your kit. Your power supply must be FCC approved.

Notice: Monitor

This kit is not intended for use with X-Y monitors. Suitable monitors have horizontally mounted CRTs and raster electronics with inputs for red, green and blue video, as well as Composite Negative Sync inputs.

Notice: Coin Mechanism

Be sure to clean and lubricate your old coin mechanisms. Servicing them is crucial to your game's earning potential and operation.

Notice: Coin Meters

Coin meters are not provided with this kit. Wiring information is provided as a convenience to the operator.

Notice: Servicing, Installing

Always turn your game Off and unplug it before attempting to service or install your kit.

ATTENTION !

PROPERLY ATTACH ALL CONNECTORS. *Be sure that the connectors on each printed circuit board (PCB) are properly connected. If they do not slip on easily, do not force them. A reversed connector may damage your kit and void the warranty. All connectors are keyed to fit specific pins on each board.*

CONVERSION PROCEDURES

Inspection

Unpack the materials from the carton and inspect for obvious signs of damage. Use this checklist to be sure your kit is complete.

Part No.	Item	Quantity
[ ] A-17266-40029	CPU Board	1
[ ] A-17319-40029	DCS Sound board	1
[ ] H-16561	STREET FIGHTER II Adapter Cable	1
[ ] H-17354	Main JAMMA Cable	1
[ ] H-17442-2	Sound Power Speaker Cable	1
[ ] H-17455	Extra Function Cable	1
[ ] H-17456	Y-T Adapter Cable	1
[ ] 16-44029-101	Instruction Manual	1
[ ] 16-9383	Controls Template	1
[ ] 20-9687-1	Red Pushbutton	4
[ ] 20-9687-2	White Pushbutton	4
[ ] 20-9687-3	Blue Pushbutton	4
[ ] 20-9694-1	Red 8-way Joystick	2
[ ] 31-1789	Clear Control Panel Overlay	1
[ ] 31-1829	Screened Overlay	1
[ ] 31-1830-1	Screened Marquee	1
[ ] 31-1832	Side Art Decal	2
[ ] 31-1833	Decal Pad	1
[ ] 5795-10937-18	20-pin Ribbon Cable	1
[ ] Assorted Hardware		

Always Install PC Boards Exactly As Shown On Page 3-38.

Recommended Tools and Supplies

[ ] black semi-gloss paint
[ ] electric drill
[ ] electric screwdriver
[ ] grease pencil or marker
[ ] hex driver
[ ] 180 grit sandpaper or electric sander
[ ] pliers
[ ] razor knife
[ ] soldering iron and solder
[ ] wire cutters
[ ] black electrical tape

Converting from a STREET FIGHTER II game cabinet

Cabinet Modifications

1. Remove the old decals and artwork and clean the glue residue. Repaint the cabinet with black semi-gloss paint. Allow paint to dry.

2. Pencil a line roughly at the top of the old graphic. Lightly moisten the cabinet with soapy water. Apply the decal starting at the top and working down. After the decal is in place, smooth it down, taking care to squeeze out the air bubbles. If you miss an air bubble, pop it with a razor blade or a pin and burnish it down. Allow 12 hours for the adhesive in the decals to set. Remove masking.

3. Check the kit for an FCC sticker and apply it over the existing sticker on the cabinet. See NOTICE to the left.

4. Apply the Game Play Instruction Decal to the CRT viewing glass. Be sure the decal does not obstruct the CRT.

NOTICE

When Midway ships a game, it is in compliance with FCC regulations. Your sticker is proof. If the sticker is missing or damaged, legal repercussions to the owner or distributor of the game may result. If your game kit does not contain an FCC sticker, call Midway Manufacturing immediately.

Control Panel Modifications

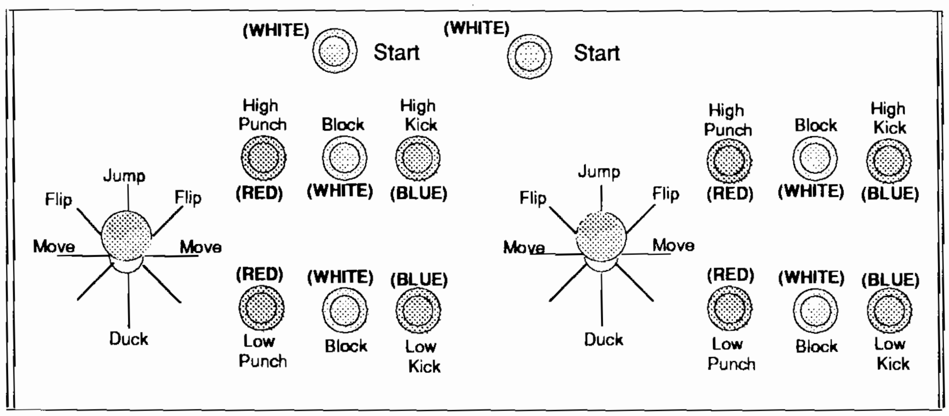
1. Remove the control panel buttons and joysticks and remove the old vinyl covering and artwork. Tagging the wires as they are removed from the pushbutton and joystick switches will make reinstallation easier.

2. Carefully remove the backing on the vinyl control panel overlay. Place the overlay on top of the control panel. Prevent air bubbles from getting under the vinyl overlay.

3. After the overlay is in place, use a razor knife to cut holes for the pushbuttons and joysticks. Position the stickers around the approiate hole locations. See the page 1-5 for sticker locations.

4. Remove the switch from the pushbutton by pulling the large prong away from the switch, then pull the switch off the housing. Unscrew the nut from the housing. Push the switch housing through the control panel from the front. Screw the nut back onto the switch housing from the back of the control panel. Push the switch back into the switch housing.

5. Remove the "E"-ring and slide the shaft and the plastic ring off the joystick base. Be sure that the bushings remain in the base. Screw the base to the underside of the control panel. Slide the plastic ring around the shaft so that the rough side is next to the shaft handle. Slide the shaft through the control panel and base. Replace the "E"-ring.



Typical control panel layout & sticker locations for modification of a STREET FIGHTER II control panel

PC Board Installation

1. Replace the existing CPU board and sound board with the **Mortal Kombat II** CPU board and sound board.

2. Plug the JAMMA connector into the CPU board at P1. Plug the 10-pin connector of the Adapter cable into the 10-pin JST type connector from the control panel. Be sure to match the wire colors of both connectors. Plug the other end of the Adapter cable into the CPU board at P5.

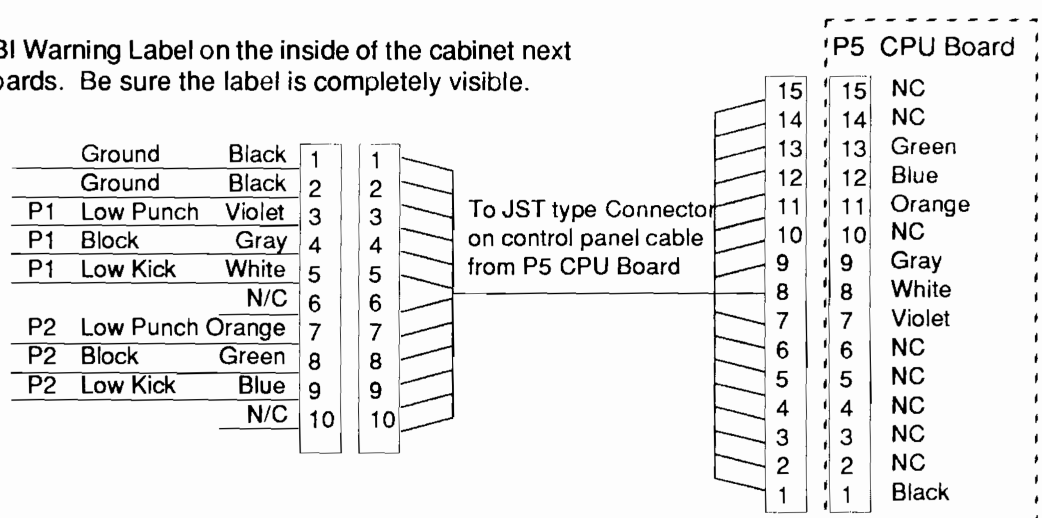
3. Connect the ribbon cable from P4 on the sound board to P12 on the CPU board. Be sure that the red line goes to the same pin on both boards. Connect the wire harness cable from P1 on the sound board to P3 (sound power speaker connector) on the CPU board.

Note

The ribbon cable may need to be twisted in order to connect it properly.

4. Only P1, P3, P4, P5, P12 and P14 through P17 are used on the CPU Board. All other connectors on the CPU are not used.

5. Place the FBI Warning Label on the inside of the cabinet next to the PC boards. Be sure the label is completely visible.



Adapter cable for STREET FIGHTER II conversion

Converting from a typical video game cabinet

Cabinet Modifications

1. Repaint the cabinet with black semi-gloss paint (games with wood grain sides: remove the old decals and artwork and clean the glue residue before painting). Allow paint to dry.

2. Pencil a line roughly at the top of the old graphic. Lightly moisten the cabinet with soapy water. Apply the decal starting at the top and working down. After the decal is in place, smooth it down, taking care to squeeze out the air bubbles. If you miss an air bubble, pop it with a razor blade or a pin and burnish it down. Allow 12 hours for the adhesive in the decals to set. Remove masking.

3. Check the kit for an FCC sticker and apply it over the existing sticker on the cabinet. See NOTICE to the left.

4. Apply the Game Play Instruction Decal to the CRT viewing glass. Be sure the decal does not obstruct the CRT.

NOTICE

When Midway ships a game, it is in compliance with FCC regulations. Your sticker is proof. If the sticker is missing or damaged, legal repercussions to the owner or distributor of the game may result. If your game kit does not contain an FCC sticker, call Midway Manufacturing immediately.

Control Panel Modifications

1. Remove the control panel buttons and joysticks and remove the old vinyl covering and artwork.

2. Use the control panel template to help you design your control panel. You will need to use the template twice. Once for the left player controls and once for the right player controls. Refer to page 1-7 for suggested template layouts.

3. Drill holes as needed for the joysticks and control panel buttons. Plug previous holes with wood blocks, putty, cardboard or epoxy. File the new holes smooth.

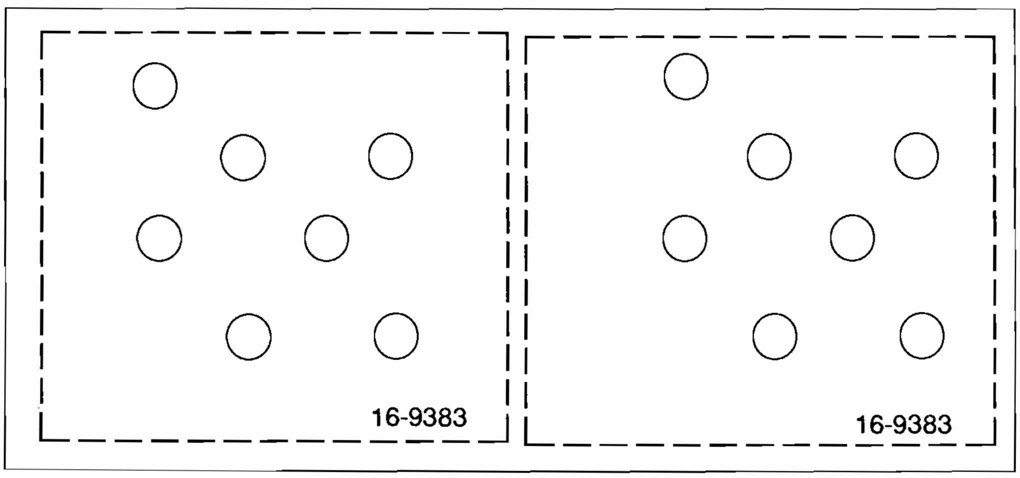
4. Carefully remove the backing on the vinyl control panel overlay. Place the overlay on top of the control panel. Prevent air bubbles from getting under the vinyl overlay.

5. a) After the overlay is on securely, use a razor knife to cut holes for the control panel buttons and joysticks.
   b) Position the stickers around the appropriate locations. Refer to page 1-7 for suggested control panel button and joystick sticker locations.

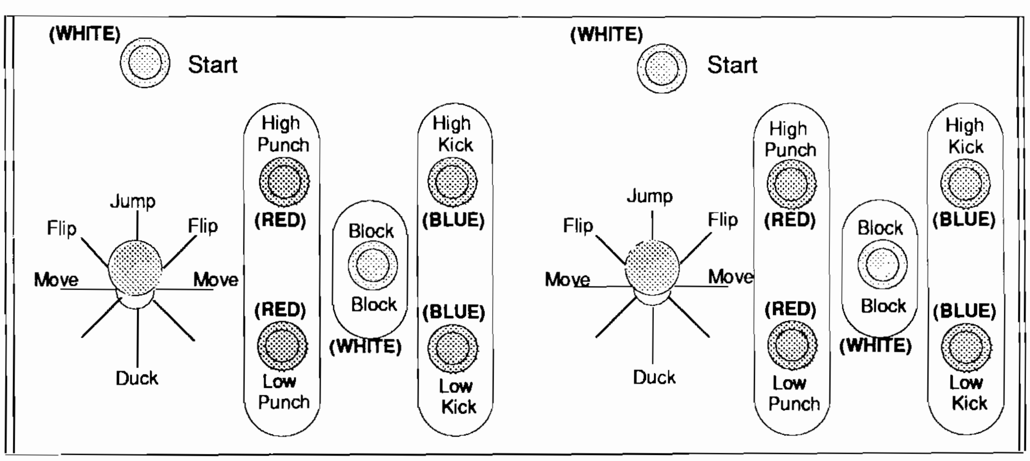
6. Remove the switch from the pushbutton by pulling the large prong away from the switch, then pull the switch off the housing. Unscrew the nut from the housing. Push the switch housing through the control panel from the front. Screw the nut back onto the switch housing from the back of the control panel. Push the switch back into the switch housing.

7. Remove the "E"-ring and slide the shaft and the plastic ring off the joystick base. Be sure that the bushings remain in the base. Screw the base to the underside of the control panel. Slide the plastic ring around the shaft so that the rough side is next to the shaft handle. Slide the shaft through the control panel and base. Replace the "E"-ring.

Suggested control panel template layout



Suggested control panel layout and sticker locations for a typical video game control panel



Installing the PC boards and wiring into a JAMMA game cabinet

1. Disconnect and remove the existing CPU board and sound board in the JAMMA game cabinet.

2. Mount the CPU board inside the JAMMA game cabinet where the old CPU board was located. Mount the sound board next to the CPU board using the stand-offs and screws provided.

Note

If you choose to use your own JAMMA Cable and not the one provided in the kit, be sure to check the JAMMA Cable Chart to verify that it is compatible.

3. If you choose to use the JAMMA cable provided with the kit, disconnect your old JAMMA cable from the speaker, power supply, control panel switches (may already be disconnected) and coin door. Remove the cable from the game. If you are not going to use the JAMMA Cable provided with the kit, check the JAMMA Cable Chart to be sure your cable is compatible. Leave your power supply chassis as is.

CAUTION

Properly insulate any unused wires within the JAMMA cable, especially the gray, gray-green and gray-yellow wires. This is a fully wired JAMMA cable. Many of the wires will not be used for this kit. These wires have been installed so that you can use this cable for future kits

4. Connect the JAMMA cable to P1 on the CPU board. Use the Cabinet Wiring Diagram for reference and solder the correct JAMMA cable wires to the speaker. Then, connect the wires to the coin door, power supply and control panel.

   Player 1 has white-color stripe wires except for Start 1 which has a solid white wire. Player 2 has violet-color stripe wires. Follow the Control Panel Wire Color List on the inside of the back cover, or the Cabinet Wiring Diagram in Section 3 of this book.

5. Connect the Auxiliary cable to P5 of the CPU board. Follow the Cabinet Wiring Diagram or the Control Panel Wire Color List and connect the wires to the switches for the Low Punch and Low Kick buttons for players 1 & 2.

Note

The ribbon cable may need to be twisted in order to connect it properly.

6. Connect the ribbon cable from P4 on the sound board to P12 on the CPU board. Be sure that the red line goes to the same pin on both boards. Connect the wire harness cable from P1 on the sound board to P3 (sound power speaker connector) on the CPU board.

7. Only P1, P3, P4, P5, P12 and P14 through P17 are used on the CPU Board. All other connectors on the CPU are not used.

8. Place the FBI Warning Label on the inside of the cabinet next to the PC boards. Be sure the label is completely visible.

Installing the PC boards and wiring into a NON-JAMMA game cabinet

1. Disconnect and remove the existing CPU board and sound board in the game cabinet.

2. Mount the CPU board inside the game cabinet where the old CPU board was removed. Mount the sound board next to the CPU board using the stand-offs and screws provided.

3. Leaving several inches of wire, cut the wires at the coin door, control panel switches (which may already be disconnected) speaker and power supply. Remove the existing harness from the cabinet. Leave the cable hooks in place.

4. Install the JAMMA cable provided in this kit. Players 1 & 2, the coin door and the power supply wires are bundled together in individual groups. Insure that the cable is properly dressed and supported.

5. Connect the JAMMA cable to P1 on the CPU board. Use the Cabinet Wiring Diagram for reference and solder the correct JAMMA cable wires to the speaker. Then, connect the wires to the coin door, power supply and control panel.

   Player 1 has white-color stripe wires except for Start 1 which has a solid white wire. Player 2 has violet-color stripe wires. Follow the Control Panel Wire Color List on the inside of the back cover, or the Cabinet Wiring Diagram in Section 3 of this book.

6. Connect the Auxiliary cable to P5 of the CPU board. Follow the Cabinet Wiring Diagram or the Control Panel Wire Color List and connect the wires to the switches for the Low Punch and Low Kick buttons for players 1 & 2.

7. Connect the ribbon cable from P4 on the sound board to P12 on the CPU board. Be sure that the red line goes to the same pin on both boards. Connect the wire harness cable from P1 on the sound board to P3 (sound power speaker connector) on the CPU board.

8. Only P1, P3, P4, P5, P12 and P14 through P17 are used on the CPU Board. All other connectors on the CPU are not used.

9. Place the FBI Warning Label on the inside of the cabinet next to the PC boards. Be sure the label is completely visible.

Note

Be sure all spliced wires are well insulated with black electrical tape.

⚠ CAUTION

Properly insulate any unused wires within the JAMMA cable, especially the gray, gray-green and gray-yellow wires. This is a fully wired JAMMA cable. Many of the wires will not be used for this kit. These wires have been installed so that you can use this cable for future kits

Note

The ribbon cable may need to be twisted in order to connect it properly.

Game Features

STARTING UP

Switch on power to the game. A "rug" pattern appears on the CRT screen. When the "rug" pattern ends, the screen shows CHECKING SCRATCH RAMS, and then CHECKING ROMS. The next screen shows **MORTAL KOMBAT II** REVISION LEVEL, CMOS TEST OK and the COIN SETTING. The game then begins the Attract Mode.

Note

When an error is detected during Start-up Tests, game start-up does not progress, and an error message appears on the screen.

Insert the desired amount of coins, bills or tokens. Press the appropriate Start button. Use the joysticks to select an on-screen player. Use a control panel button to lock in the selection. The game starts automatically.

Player Controls

- **Start Buttons**
  Each player has a Start button which allows him/her to begin or continue play.

- **High Kick/High Punch Buttons**
  Allows the on-screen player to kick or punch an opponent in the upper body.

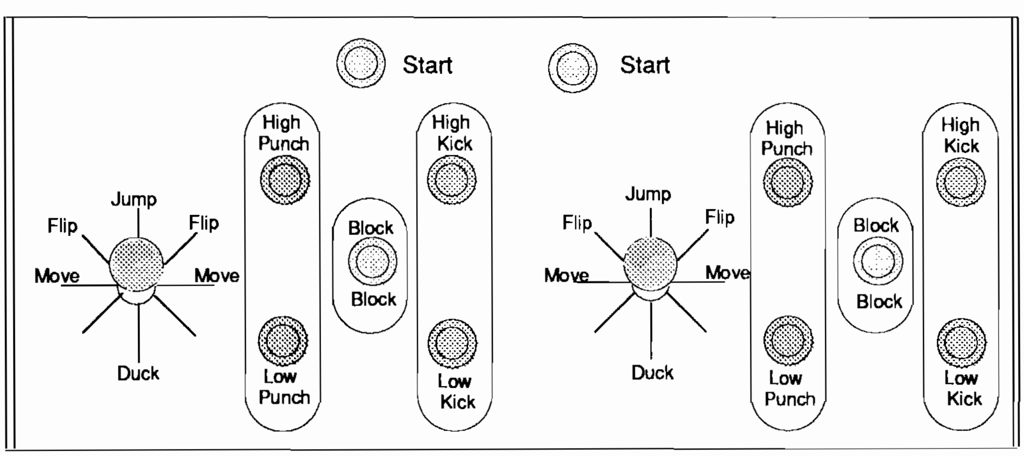
- **Low Kick/Low Punch Buttons**
  Allows the on-screen player to kick or punch an opponent in the lower body.

- **Block Buttons**
  Allows the on-screen player to block an opponent's punch, kick or special move.

- **Joystick**
  Allows the on-screen player to move, flip, jump and duck.

Note

Discover secret moves by using joystick and button combinations.



Control Panel

Menu System Operation

OPERATION

All **MORTAL KOMBAT II** Game Audits, Adjustments, and Diagnostics are options of the Main Menu. Each option in turn, has its own menu, listing several choices that you may act upon as desired.

Close Switch #8 of DIP Switch Bank #2 to activate the Main Menu (shown below). Game adjustments, bookkeeping, and diagnostics are all accessible from this menu.

Move any joystick up or down to cycle through the menu options. Notice that the options are highlighted in sequence. Press any button to activate a highlighted option.
Note: Only highlighted options can be activated.

SELECT WITH ANY STICK
ACTIVATE WITH ANY BUTTON

DIAGNOSTIC TESTS

COIN BOOKKEEPING

GAME AUDITS

GAME ADJUSTMENT

UTILITIES

VOLUME ADJUST

EXIT TEST MENU

MAIN MENU

DIAGNOSTIC TESTS

To enter the Diagnostic Tests from the Main Menu, move any joystick to select (highlight) the Diagnostic Test option and press any control panel button to activate the option.

SELECT WITH ANY STICK
ACTIVATE WITH ANY BUTTON

SWITCH TEST

DIP SWITCH TEST

CPU BOARD TEST

SOUND BOARD TEST

MONITOR PATTERNS

BURN-IN TEST

RETURN TO MAIN MENU

DIAGNOSTIC MENU

Switch Test

The Switch Test allows the operator to test the switches on the control panel and the coin door (if wired).

Select the Switch Test by using any joystick to highlight the Switch Test option, then press any control panel button to activate the option.

During the Switch Test, the top of the screen shows the locations of the control panel switches. The bottom of the screen shows the locations of the coin door switches. Press a control panel switch and the switch location, on the top of the screen, lights. Press a coin door switch and the switch location, on the bottom of the screen, lights. Release the switch and the screen returns to normal.

Press the Start buttons together to return to the Diagnostic Menu.

DIP Switch Test

The DIP Switch Test allows the operator to check the position of the two DIP Switches on the CPU Board. The operator can also change the setting of each position of each DIP Switch during this mode.

Use any joystick to select the DIP Switch Test and any control panel button to activate it. The screen displays their current settings.

To change a DIP Switch setting, press the switch to the desired setting, then check the screen to verify that the switch now shows the new setting.

Press any control panel button to return to the Diagnostic Menu.

DIP Switch 1 Settings Table

	SW 1	SW 2	SW 3	SW 4	SW 5	SW 6	SW 7	SW 8
Violence On	Off * On							
Blood in game		Off * On						
Low Blow in game			Off * On					
Attract Sounds On				Off * On				
Comic Offer On					Off * On			
Dollar Bill Validator Not Installed Installed						Off * On		
Not Used							Off * On	Off * On

DIP Switch 2 Settings Table

	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8
Coinage DIP Switch CMOS	Off * On							
Coin Settings USA 1 / Ger 1 / Fr 1 USA 2 / Ger 2 / Fr 2 USA 3 / Ger 3 / Fr 3 USA 4 / Ger 4 / Fr 4 USA ECA / Ger ECA / Fr ECA N/U / N/U / N/U N/U / N/U / N/U Free Play / Free Play / Free Play		Off * On Off On Off On Off On	Off * Off On On Off Off On On	Off * Off Off Off On On On On				
Country USA German French Not Used					Off * On Off On	Off * Off On On		
One Counter **Two Counters**							Off * On	
Test Switch Game Mode Test Mode								Off * On

* Indicates Factory Setting

CPU Board Test

The CPU Board Test (much like the Start-up Test) allows the operator to check the RAMs and ROMs.

Select the CPU Board Test with any joystick, then press any control panel button to activate the automatic test of the CPU Board's RAMs and ROMs.

When this test is activated a "rug" pattern appears on the screen. The screen then changes to show the layout of the RAMs and ROMs. A ROM or RAM location that is shown as black with a white outline is used and should turn either red or green. A ROM or RAM location that is shown as gray with a white outline is not used in this game. During the test ROMs or RAMs are good if they turn green and they are faulty if they turn red.

The CPU Test pauses when a bad ROM or RAM is detected. Press any button to continue the test.

Sound Board Test

This test allows listening to some of the sounds that this game is capable of producing.

Select the Sound Board Test with any joystick, then press any control panel button to activate it. The screen displays two test options.

GENERAL TEST analyzes the sound circuitry. The screen shows a list of error codes. A successful test causes a single "tone" to sound. Detection of a fault causes a series of tones or no tone at all to sound.
PLAY SOUNDS tests synthesized & digitized sounds from the Sound Board. Advance to the next sound by pressing any action button. Press either Start button to repeat a sound.

Select RETURN TO MAIN MENU or BACK TO DIAGNOSTIC MENU. Press any control panel button to activate your selection.

GENERAL TEST
PLAY SOUNDS
BACK TO DIAGNOSTIC MENU
RETURN TO MAIN MENU

SOUND TEST MENU

Monitor Patterns

The Monitor Patterns Test provides a menu for testing the monitor.

Select the test with any joystick and activate with any control panel button. Once in the Monitor Patterns Test, move any joystick to select a test option and press any control panel button to activate it. Press any control panel button again to return to the Monitor Patterns Test menu.

SELECT WITH ANY STICK ACTIVATE WITH ANY BUTTON

RED SCREEN
GREEN SCREEN
BLUE SCREEN
COLOR BARS
CROSSHATCH PATTERNS
BACK TO DIAGNOSTIC MENU
RETURN TO MAIN MENU

MONITOR PATTERN MENU

The **RED, GREEN** and **BLUE SCREEN** tests fill the screen with either red, green or blue.
The **COLOR BARS** test fills the screen with several shades of colors to help with red, green and blue level adjustments. Each color should appear sharp and clear.
The **CROSSHATCH PATTERNS** test fills the screen with a grid and a series of dots. The grid and the dots should be clear. The dots should appear round.

If any of the Monitor Pattern Tests shows a need for adjustment use the proper white knobs on the Monitor Board.

Use any joystick to select RETURN TO MAIN MENU or BACK TO DIAGNOSTIC MENU and activate with any control panel button.

Burn-in Test

The Burn-in Test continually repeats the CPU Board Test. Move any joystick to select the Burn-in Test, then press any control panel button to activate the test. When the Burn-in Test detects an error, the test stops and displays an error message on the screen. The second page of the Audit Table specifies the number of Burn-in cycles successfully completed. Use this test to find intermittent CPU problems.

To exit this test switch the game Off then On again.

COIN BOOKKEEPING

To enter the Coin Bookkeeping from the Main Menu, move any joystick to select the Coin Bookkeeping option, then press any control panel button to activate it.

The Coin Bookkeeping Table records the coinbox totals and game play counters. The left side of the table names the bookkeeping item and the right side shows the number of coins, credits, or plays for each item.

To exit Coin Bookkeeping, move any joystick to select RETURN TO MAIN MENU, then press any control panel button to activate it.

LEFT SLOT COINS	0
RIGHT SLOT COINS	0
THIRD SLOT COINS	0
FOURTH SLOT COINS	0
SERVICE CREDITS	0
PAID CREDITS	0
TOTAL PLAYS	0
PLAYS UNTIL HIGH SCORE RESET	5000

MORE DETAILED DATA
RETURN TO MAIN MENU

COIN BOOKKEEPING TABLE

LEFT SLOT COINS	0
RIGHT SLOT COINS	0
THIRD SLOT COINS	0
FOURTH SLOT COINS	0
TOTAL COLLECTIONS	0

CLEAR COIN METERS
RETURN TO MAIN MENU

TOTAL COLLECTION TABLE

GAME AUDITS

To enter Game Audits from the Main Menu, move any joystick to select the Game Audits option, then press any control panel button to activate it. To advance to the next (or return to the previous) page of the Game Audit Table, move any joystick to select either "Next Audit Page" or "Previous Audit Page", then press any control panel button to change the page.

The Game Audits Table records the game play statistics. The left side of the table names the Audit item the right side shows the amount of play.

HOURS GAME WAS ON	0
HOURS PLAYED WITH 1 PLAYER	0
HOURS PLAYED WITH 2 PLAYERS	0
TOTAL PLAYS	0
1 PLAYER CONTINUES TAKEN	0
2 PLAYER CONTINUES TAKEN	0
BURN-IN LOOPS SUCCESSFULLY COMPLETED	0

NEXT AUDIT PAGE
RETURN TO MAIN MENU

PAGE 1 OF AUDIT TABLE

KUNG LAO CHOSEN	0
LIU KANG CHOSEN	0
CAGE CHOSEN	0
BARAKA CHOSEN	0
KITATA CHOSEN	0
MILEENA CHOSEN	0
SHANG TSUNG CHOSEN	0
RAIDEN CHOSEN	0
SUB-ZERO CHOSEN	0
REPTILE CHOSEN	0
SCORPION CHOSEN	0
JAX CHOSEN	0

PREVIOUS AUDIT PAGE
RETURN TO MAIN MENU

PAGE 2 OF AUDIT TABLE

To exit the Game Audit Table, move any joystick to select RETURN TO MAIN MENU, then press any control panel button to activate your selection.

GAME ADJUSTMENTS

Move any joystick to select the Game Adjustment option on the Main Menu, then press any control panel button to activate it.

The Game Adjustments Menu allows the owner/operator to change the Game Pricing and Game Difficulty.

The Game Adjustments Menu offers several options. Each option has several choices. Move any joystick to select an option, then press any control panel button to activate that option. The next menu screen provides a setting choice. Move any joystick to modify the setting value, then press any control panel button to lock in the new value and return to the Adjustment Menu. Move the joystick up to increase the setting value, move the joystick down decrease the setting value.

To exit the Adjustments Menu, use any joystick to select RETURN TO MAIN MENU, then use any control panel button to activate your selection.

Note

Game Adjustments are explained in more detail on the following page.

Adjustment values set by DIP Switch, override adjustment values set by the menu system.

SELECT WITH ANY STICK PRESS ANY BUTTON TO MODIFY

RETURN TO MAIN MENU
STANDARD PRICING
CUSTOM PRICING
FREE PLAY
COMPUTER DIFFICULTY
WINNING STREAK RESET
RETURN TO MAIN MENU

GAME ADJUSTMENT MENU

Game Adjustments

Standard Pricing
Standard Pricing allows the operator to choose any of the "Standard" selections for the Standard Pricing Table. See page 1-20.

Modify the setting value with any joystick. Press any control panel button to lock in the new value and return to the Adjustment Menu.

Custom Pricing
Custom Pricing allows the operator to install pricing other than that of the Standard Pricing Table. Custom Pricing also allows the operator to select the maximum amount of credits per game, the amount of credits required to start a game, and the amount or credits required to continue a game. This option is being adjusted from the Dip Switch Settings. See page 1-21.

Modify the setting value with any joystick. Press any control panel button to lock in a new value and return to the Adjustment Menu.

Free Play
This option selects free play. The setting choices for this adjustment are:

- No (factory)
- Yes

Computer Difficulty
This option determines the difficulty level of game play. The setting choices for this adjustment are:

-1 (Extra Easy)
-2 (Easy)
-3 (Medium; factory)
-4 (Hard)
-5 (Extra Hard)

Winning Streak Reset
This option resets the highest scores after a selected amount of games are played. The setting choices for this adjustment are:

- Reset every 5,000 games.
- Reset every 10, 000 games (factory).
- Reset every 15, 000 games.
- Do Not Reset.

Standard Pricing Table

Name	Settings Credit/Coin	Left Chute	Center Chute	Right Chute	Fourth Chute
USA 1	1/25¢ (2 to Start; 2 to Continue)	25¢	$1.00	25¢	
USA 2	1/25¢ (2 to Start; 1 to Continue)	25¢	$1.00	25¢	
USA 3	1/25¢ (1 to Start; 1 to Continue)	25¢	$1.00	25¢	
USA 4	1/50¢, 3/$1.00 (1 to Start; 1 to Continue)	25¢	$1.00	25¢	
USA 5	1/50¢, 4/$1.00 (2 to Start; 1 to Continue)	25¢	$1.00	25¢	
USA 6	1/50¢ (1 to Start; 1 to Continue)	25¢	$1.00	25¢	
USA 7	1/50¢, 3/$1.00 (1 to Start; 1 to Continue)	25¢	$1.00	25¢	
USA 8	1/50¢, 4/$1.00 (2 to Start; 2 to Continue)	25¢	$1.00	25¢	
USA ECA	1/25¢, 4/$1.00 (2 to Start; 2 to Continue)	$1.00	10¢	25$	5¢
German 1	1/1DM, 6/5DM	1DM		5DM	
German 2	1/1DM, 7/5DM	1DM		5DM	
German 3	1/1DM, 8/5DM	1DM		5DM	
German 4	1/1DM, 5/5DM	1DM		5DM	
German 5	1/1DM, 6/5DM	1DM		5DM	
German ECA	1/1DM, 2/2DM, 6/5DM	5DM	1DM	2DM	
France 1	2/5F, 5/10F	5F		10F	
France 2	2/5F, 4/10F	5F		10F	
France 3	1/5F, 3/10F	5F		10F	
France 4	1/5F, 2/10F	5F		10F	
France 5	2/5F, 5/10F, 11/2 x 10F	5F		10F	
France 6	2/5F, 4/10F, 9/2 x 10F	5F		10F	
France 7	1/5F, 3/10F, 7/2 x 10F	5F		10F	
France 8	1/5F, 2/10F, 5/2 x 10F	5F		10F	
France 9	1/3 x 1F, 2/5F	1F		5F	
France 10	1/2 x 1F, 3/5F	1F		5F	
France 11	1/3 x 1F, 2/5F, 5/2 x 5F	1F		5F	
France 12	1/2 x 1F, 3/5F, 7/2 x 5F	1F		5F	
France ECA	1/3 X 1F, 2/5F, 5/2 X 5F	1F	10F	5F	
Canada	1/2 x 25¢, 3/$1.00	25¢		$1.00	
Swiss 1	1/1F, 6/5F	1F		5F	
Swiss 2	1/1F, 7/5F	1F		5F	
Swiss 3	1/1F, 8/5F	1F		5F	
Italy	1/500 lire	500 lire		500 lire	
UK 1	1/20P, 3/50P	20P		50P	
UK 2	2/20P, 5/50P	20P		50P	
UK ECA	1/20P, 3/50 P, 7/£1.00	£1.00	20P	50P	10P
UK Elec w/CCU	1/30P, 2/50P, 4/£1.00	£1.00		CCU	
Spain 1	1/100 peseta, 6/500 peseta	100 peseta		500 peseta	
Spain 2	1/100 peseta, 5/500 peseta	100 peseta		500 peseta	
Australia 1	1/3 x 20¢, 2/$1.00	20¢		$1.00	
Australia 2	1/5 x 20¢, 1/$1.00	20¢		$1.00	
Japan 1	1/100 yen	100 yen		100 yen	
Japan 2	2/100 yen	100 yen		100 yen	
Austria 1	1/5 schilling, 2/10 schilling	5 schilling		10 schilling	
Austria 2	1/2 x 5 schilling, 3/2 x 10 schilling	5 schilling		10 schilling	
Belgium 1	1/20F	20F		20F	
Belgium 2	3/20F	20F		20F	
Belgium 3	2/20F	20F		20F	
Belgium ECA	1/20F	50F	5F	20F	
Sweden	1/3 x 1 krona, 2/5 krona	1 krona		5 krona	
New Zealand 1	1/3 x 20¢	20¢		20¢	
New Zealand 2	1/2 x 20¢	20¢		20¢	
Netherlands	1/1HFl, 3/2.5HFl	1HFl		2.5HFl	
Finland	1/1 markka	1 markka		1 markka	
Norway	1/2 x 1 krone, 3/5 x 1 krone	1 krone		1 krone	
Denmark	1/2 x 1 krone, 3/5 krone, 7/2 x 5 krone	1 krone		5 krone	
Antillies	1/25¢, 4/1 guilder	25¢		1 guilder	
Hungary	1/2 x 10 forint, 3/2 x 20 forint	10 forint		20 forint	

If option desired is not shown above, use Custom pricing.

Custom Pricing

SELECT WITH ANY STICK PRESS ANY BUTTON TO MODIFY

RETURN TO ADJ. MENU
(1) LEFT CHUTE UNITS
(1) RIGHT CHUTE UNITS
(1) THIRD CHUTE UNITS
(1) FOURTH CHUTE UNITS
(2) UNITS/CREDITS
(3) UNITS/BONUS
(4) MINIMUM UNITS REQUIRED
(5) CREDITS TO START
(6) CREDITS TO CONTINUE
(7) COINS PER DOLLAR
MAXIMUM CREDITS
RETURN TO ADJ. MENU

(1) Coins inserted accumulate units. This adjustment specfies the number of units given for each coin in the fourth chute (see "units/credit").

(2) This is the number of coin units required to buy one credit.

(3) One bonus credit is awarded after this many coin units have accumulated.

(4) No credits will be awarded until this many coin units have accumulated.

(5) Each player needs this many credits to begin a game.

(6) Each player needs this many credits to continue a game.

(7) The detailed bookkeeping screen shows total collections based on this many coins per dollar. (Set to zero to disable the display of money totals.)

(8) This is the limit for the credits counter. Additional coins inserted will be lost (factory setting: 30).

UTILITIES

Move any joystick to select the Utilities option on the Main Menu, then press any control panel button to activate it.

The Utilities Menu allows the owner/operator to clear the game's bookkeeping memory and to install a custom message.

SELECT WITH ANY STICK
ACTIVATE WITH ANY BUTTON

CLEAR CREDITS

CLEAR COIN COUNTERS

CLEAR GAME AUDITS

RESET HIGH SCORE

DEFAULT ADJUSTMENTS

FULL FACTORY RESTORE

RETURN TO MAIN MENU

UTILITIES MENU

Move any joystick to select an item from the Utilities Menu, then press any control panel button to activate that item. After an item has been activated, you are given the option of resetting it or not.

For example:

CLEAR COIN COUNTERS ?
ARE YOU SURE ?

YES
NO

Move any joystick to choose YES or NO, then press any control panel button to lock in your choice and to return to the Utilities Menu.

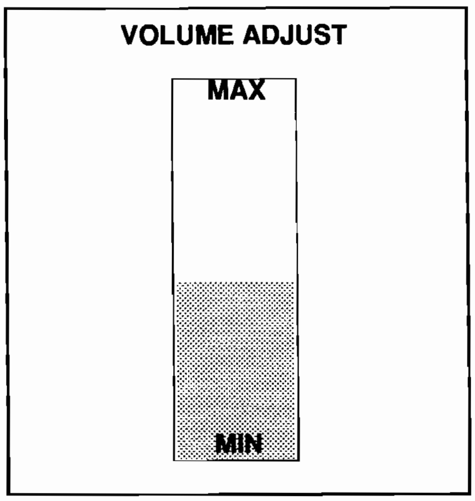
To exit the Utilities Menu, move any joystick to select RETURN TO MAIN MENU, then press any control panel button to activate your selection.

VOLUME ADJUST

Move any joystick to select the Volume Adjust option on the Main Menu, then press any control panel button to activate it.

The Volume Adjust allows the operator to control the audio level of the game.

Use any joystick, or the volume buttons, to adjust the volume to the desired level. The scale on the screen shows the volume level.



Press any button to return to the Main Menu.

Troubleshooting

Problem	Possible Solution
NO PICTURE OR DISTORTED PICTURE.	Check for faulty video board or monitor. Check for disconnected video signal cable.
TURN GAME ON AND NOTHING HAPPENS.	Check line fuse. Check for +5Vdc at pins C, D, 3, and 4 of the JAMMA Connector.
NO SOUND.	Check the speaker and speaker connection to pins L and 10 on the JAMMA Connector. Check volume control setting. Check for +12V dc at pins F and 6 on the JAMMA Connector. Check interboard wiring from CPU Board to the Sound Board.
MOVE JOYSTICK AND THE SCREEN PLAYER DOES NOT MOVE.	Check for open wires between the joystick and CPU Board. Check for contamination on joystick switch contacts and CPU Board pins. Check for proper ground.
PRESS START BUTTON AND NOTHING HAPPENS.	Check for open wires between the button and CPU Board. Check for contamination on CPU Board pins or the button switch blade contacts. Check for proper ground.
PRESS ANY CONTROL PANEL BUTTON AND SCREEN PLAYER DOES NOT MOVE.	Check for open wires between the button and CPU Board. Check for contamination on CPU Board pins or the button switch blade contacts. Check for proper ground.
NO CREDIT GIVEN WHEN COINS ARE INSERTED.	Check DIP switch coin setting. Check for contamination on coin switch contacts. Check for an open wire between Coin Switch 1 and pin 16 on the JAMMA Connector or Coin Switch 2 and pin T of the JAMMA Connector.
TOO MANY CREDITS FOR NUMBER OF COINS INSERTED.	Check Game Pricing setting. Check for a short between pins T & 16 on the JAMMA Connector.
GAME STAYS IN TEST MODE.	Check that switch #8 of DIP Switch Bank #2 is set to off.

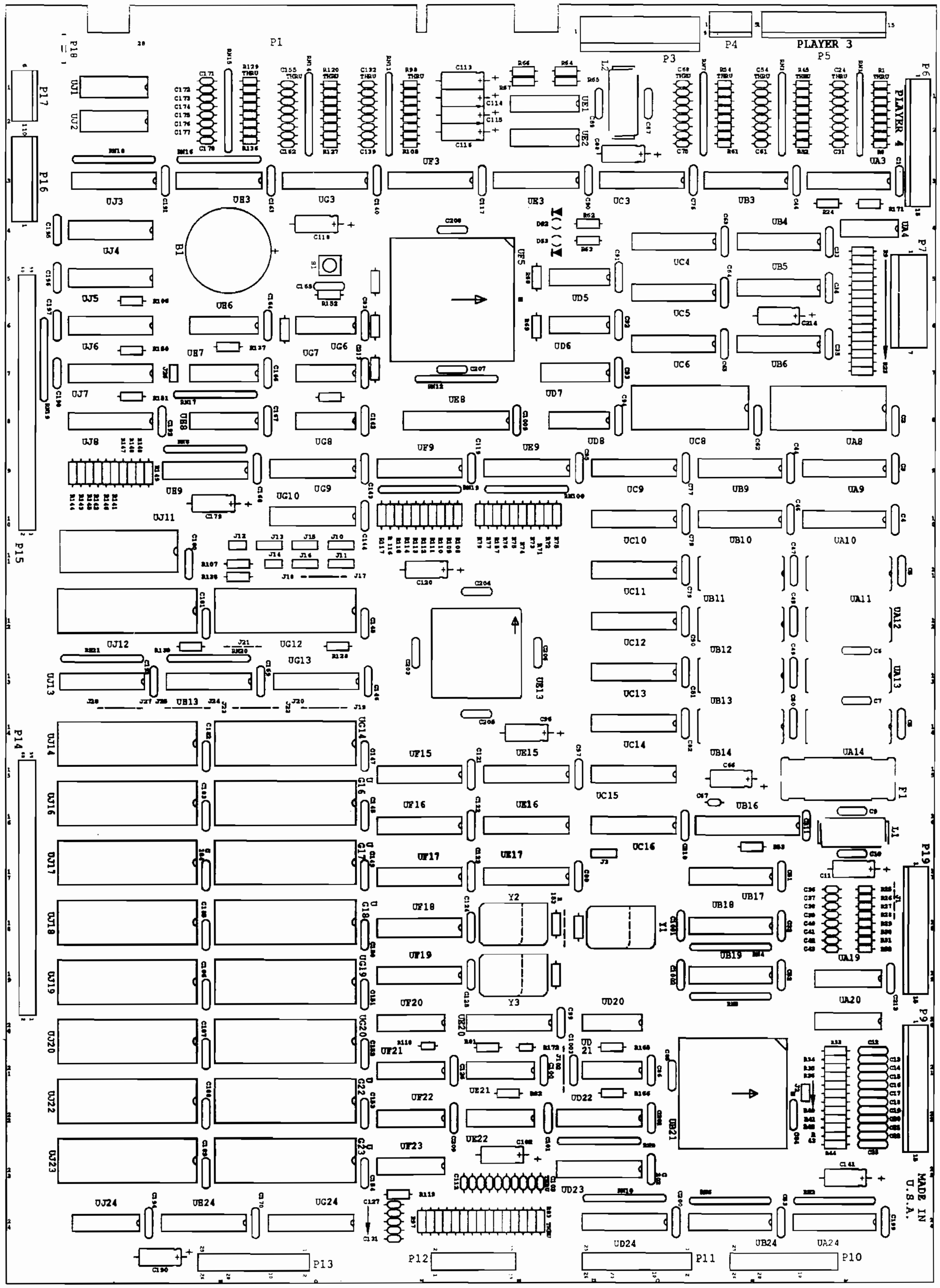
MORTAL KOMBAT II KIT

SECTION

two

Parts

A-17265-40029
CPU Board Assembly



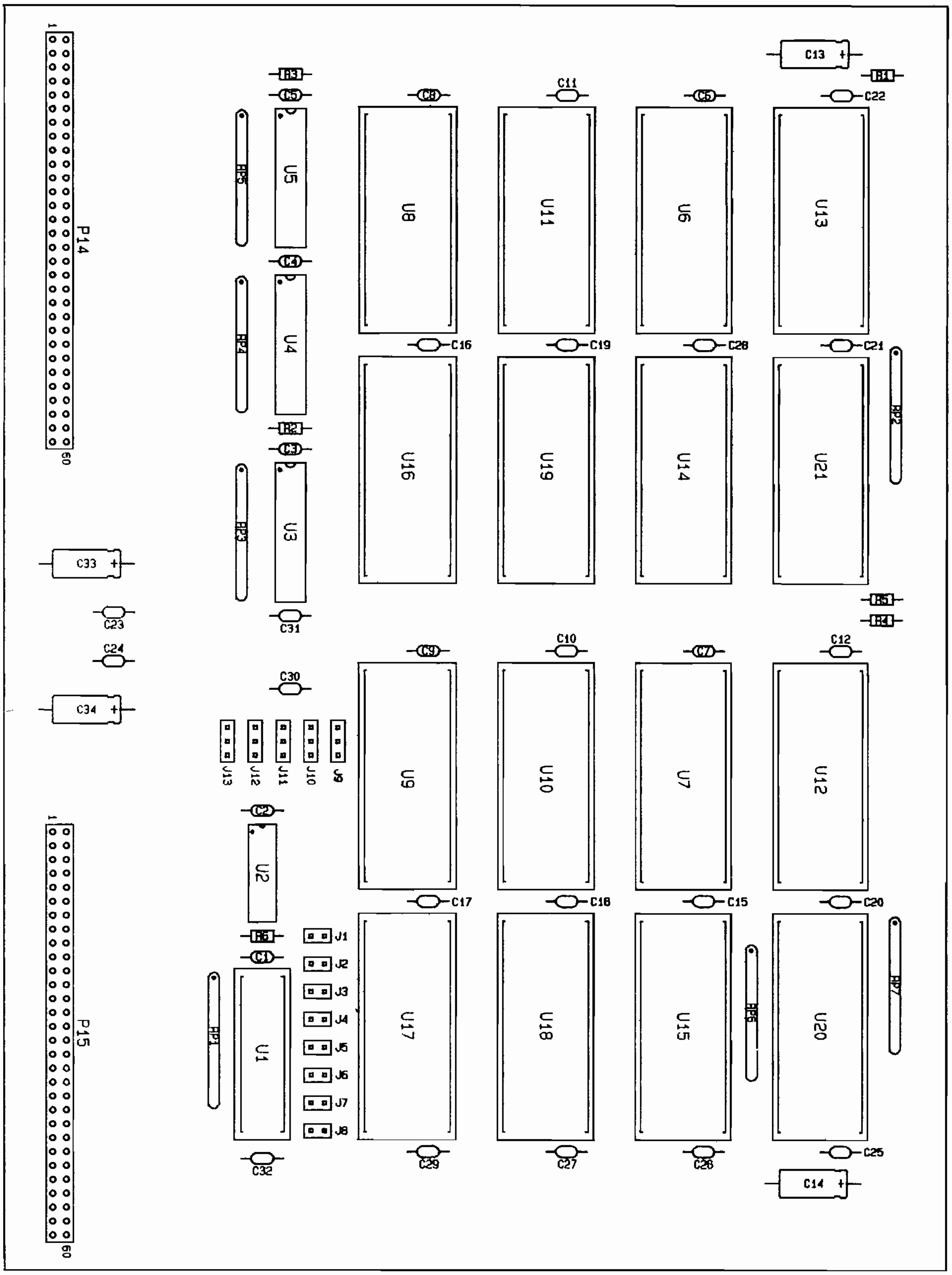
A-17265-40029
CPU Board Parts

Part Number	Part Designator	Description
5434-12255-00	UH6	IC, MAX691
5370-12602-00	UE1	IC, ULN2064
5340-12958-00	UE22, UF22, UF23	IC, 26LS31
5340-12959-00	UE21, UF20, UF21	IC, 26LS32A
5340-13020-00	UJ4, UJ5, UJ6, UJ7	IC, 44C256
5340-12558-00	UJ11	IC, 5565
5340-13322-00	UA8, UC8	IC, 5C2568
5283-10551-00	UG8	IC, 74F00
5283-10552-00	UD6	IC, 74F04
5281-09215-00	UD8	IC, 74LS04
5280-09309-00	UA4	IC, 7407
5283-12488-00	UG6	IC, 74F08
5281-09500-00	UD20	IC, 74LS32
5321-13466-00	UD21	IC, 74AC74
5281-09737-00	UD5	IC, 74LS86
5281-09745-00	UH8	IC, 74LS138
5281-13438-00	UH7	IC, 74LS155A
5281-09733-00	UE2	IC, 74LS174
5320-13437-00	UD22	IC, 74ACTQ244
5283-12890-00	UB24, UD23	IC, 74F244
5281-09867-00	UG9	IC, 74LS244
5320-13436-00	UB18, UB19	IC, 74ACTQ245
5317-12208-00	UB6, UC6, UC11, UC12, UC13, UC14, UE15, UE16, UF15, UF16, UH9, UH13, UJ8, UJ13	IC, 74ALS245 '
5283-12889-00	UA24, UD24	IC, 74F245
5283-13319-00	UD7	IC, 74F253
5283-13320-00	UB9, UF9, UF18, UG10	IC, 74F373
5281-09486-00	UA9, UA10, UB5, UB10, UC5, UC9, UC10, UC15, UC16, UE17, UE20, UF19, UG13	IC, 74LS374
5317-12211-00	UB4, UC4	IC, 74ALS541
5315-13435-00	UA3, UB3, UC3, UE3, UF3, UG3	IC, 74HCT541
5281-12887-00	UE9, UH3, UJ3	74LS541
5521-13424-03	UE19	8MHz Oscillator
5521-13424-01	UD18	50MHz Oscillator
5645-09025-00	SW1, SW2	DIP, 8-switch
5010-13364-00	R70-R77, R79, R106, R108-R117, R140-R147, R149, R150	33 Ω Res. 5%, 1/8W
5010-13363-00	R24, R69, R82-R97, R119, R128, R137, R148, R151, R171	100 Ω Res. 5%, 1/8W
5010-13372-00	R81	220 Ω Res. 5%, 1/8W
5010-13371-00	R62, R63, R66, R67	330 Ω Res. 5%, 1/8W
5010-13366-00	R45-R51, R54, R57, R58, R98-R105, R118, R120-R127, R129-R136, R172	470 Ω Res. 5%, 1/8W
5010-13361-00	R13, R14, R19	1K Ω Res. 2%, 1/8W
5010-13362-00	R12, R15, R20	2K Ω Res. 2%, 1/8W
5010-13368-00	R11, R16, R21	3.9K Ω Res. 5%, 1/8W
5010-13365-00	R53, R107, R138, R139, R152, R157, R165, R166	4.7K Ω Res. 5%, 1/8W
5010-13369-00	R10, R17, R22	8.2K Ω Res. 5%, 1/8W
5010-13370-00	R9, R18, R23	15K Ω Res. 5%, 1/8W
5019-09362-00	RN1-RN3, RN6, RN7,RN9-RN12, RN14-RN18,RN100	4.7K Ω Res SIP, 5%, 1/8W
5048-11030-00	C165	470pF Cap., 10%
5048-13375-00	C54-C60, C67, C68, C71, C72, C103-C112, C127-C139, C155-C162, C171-C178	100pF Cap.,10%
5048-11031-00	C87, C89	.001uF Cap., 10%

Part Number	Part Designator	Description
5043-08980-00	C1-C4, C9, C10, C32-C35,. C44-C46, C51-C53, C62-C65, C76-C86, C90-C95, C97-C101, C117, C119, C121-C126, C140, C142-C154, C163, C164, C166-C170, C180-C189, C191-C194, C199-C213, C1000	.01uF Cap.,
5043-08996-00	C5-C8, C47-C50, C195-C198,C1001-C1003	.1uF Cap., 20%
5040-09343-00	C11, C66, C88, C96, C102, C115, C116, C118, C120, C141, C179, C190, C214	10uF Cap., 20V
5671-13732-00	DS2, DS3	LED, Red
5551-09822-00	L2	4.7uH Coil, 3.0A
5880-11056-00	B1	Battery, Lithium 3.0V
5881-12315-00	B1	Battery Holder
5700-09915-00	UF17	20-pin Socket
5700-12047-00	UE8	24-pin Socket
5700-12088-00	UG12, UG14, UG16-UG20, UG22, UG23, UJ12, UJ14, UJ16-UJ20, UJ22, UJ23	32-pin Socket
5700-12253-00	UB21	68-pin Socket
5700-12424-00	UF5	84-pin Socket
5791-12461-05	P4	5-pin Header
5791-12461-06	P17	6-pin Header
5791-12461-10	P16	10-pin Header
5791-12461-15	P5	15-pin Header
5791-10862-07	P7	7-pin Header
5791-10862-09	P3	9-pin Header
5791-09437-00	P12	20-pin Header
5019-09669-00	RN4, RN5, RN13	1K Ω Res. 5%, 1/8W
5010-13472-00	J100, J101	47 Ω Res. 5%, 1/8W
5010-13473-00	R155	39 Ω Res. 5%, 1/8W
5010-13474-00	R158, R167-R170	68 Ω Res. 5%, 1/8W
5641-12551-00	S1	Sw-Push Button
5283-12489-00	UG7	IC, 74F32
5796-13836-00	P14, P15	60-pin Connector
5010-09534-00	J18, J19, J22, J24, J28, R154	0 Ω Res. Jumper
5400-12220-00	UB21	IC, TMS34010-50
A-16217	UE8	IC, 20L8
5410-13816-00	UF5	IC, 1020A-1
A-17480	UF17	IC, 16L8
A-5343-40029-18	UG12	EPROM
A-5343-40029-1	UG14	EPROM
A-5343-40029-5	UG16	EPROM
A-5343-40029-9	UG17	EPROM
A-5343-40029-13	UG18	EPROM
A-5343-40029-3	UG19	EPROM
A-5343-40029-7	UG20	EPROM
A-5343-40029-11	UG22	EPROM
A-5343-40029-15	UG23	EPROM
A-5343-40029-17	UJ12	EPROM
A-5343-40029-2	UJ14	EPROM
A-5343-40029-6	UJ16	EPROM
A-5343-40029-10	UJ17	EPROM
A-5343-40029-14	UJ18	EPROM
A-5343-40029-4	UJ19	EPROM
A-5343-40029-8	UJ20	EPROM
A-5343-40029-12	UJ22	EPROM
A-5343-40029-16	UJ23	EPROM
5410-12862-00	UE13	IC, DMA2
5340-13321-00	UA11-UA14, UB11-UB14	IC, 48121, 80nsec

Notes: 1. See Section 3 For Schematic; .2 * = Not for individual sale.

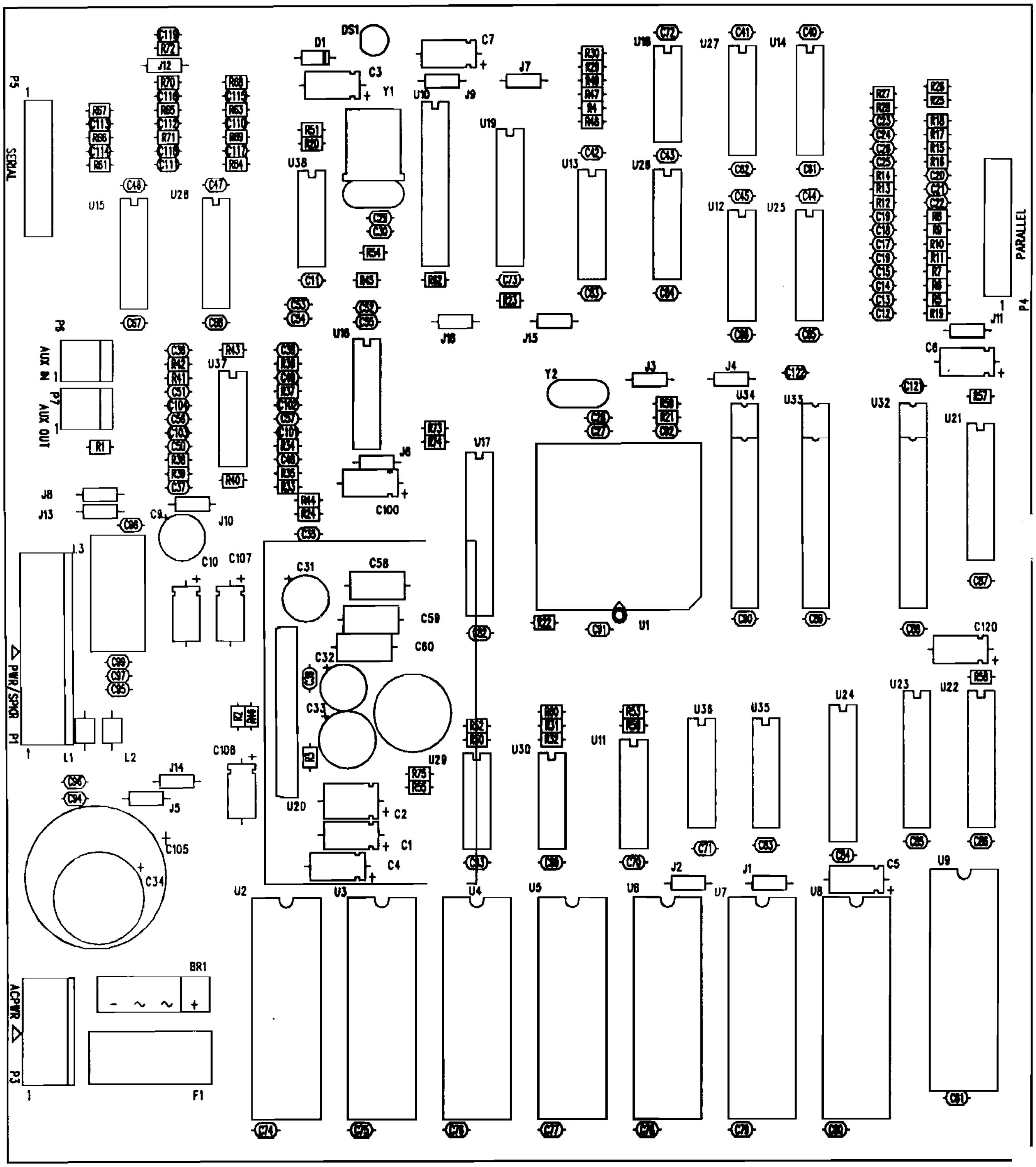
A-17264-40029
Memory Expansion Board Assembly



A-17264-40029
Memory Expansion Board Parts

Part Number	Part Designator	Description
5043-08980-00	C1-C12, C15-C32	01µf Cap. 50V
5040-09343-00	C13, C14, C33, C34	10µf Cap. 16V
5010-13365-00	R1, R6	4.7KΩ Res. 1/8W, 5%
5010-13363-00	R2-R5	100Ω Res. 1/8W, 5%
5019-09367-00	RP3-RP7	4.7Ω SIP Res. 9R, 10 pin
5320-13437-00	U3-U5	IC, 74ACTQ244
5700-12088-00	U6-U21	32-pin Socket, .600
5796-13837-00	P14, P15	60-pin Connector Header
A-5343-40029-19	U8	EPROM
A-5343-40029-20	U9	EPROM
A-5343-40029-21	U6	EPROM
A-5343-40029-22	U7	EPROM
A-5343-40029-23	U11	EPROM
A-5343-40029-24	U10	EPROM
A-5343-40029-25	U13	EPROM
A-5343-40029-26	U12	EPROM

A-17319-40029
Sound Board Assembly



A-17319-40029
Sound Board Parts

Part Number	Part Designator	Description
20-9915	J5, J8, J10, J13	Wire Insulated Jumper
5010-09534-00	J1, J4, J6, J7, J15	0Ω Res., 1/4W
5010-13363-00	R45, R48, R49, R51, R57-R60	100Ω Res., 5%
5010-13365-00	R21-R23, R25-R29, R31, R32, R50, R53, R55, R56, R73-R75	4.7KΩ Res., 5%
5010-13366-00	R4	470Ω Res., 5%
5010-13371-00	R52	330Ω Res., 5%
5010-13372-00	R47	220Ω Res., 5%
5010-13472-00	R5-R19	47Ω Res., 5%
5010-13361-00	R1	1KΩ Res., 1/8W, 2%
5013-13842-00	R33-R44	6.19KΩ Res., 1%
5010-13841-00	R24	47KΩ Res., 5%, 200V
5010-13844-00	R3, R20	100KΩ Res., 5%, 200V
5010-13858-00	R2	820Ω Res., 1/8W, 5%
5010-13370-00	R46	15KΩ Res., 1/8W, 5%
5040-09332-00	C2	47µf Cap., ±20%, Axial
5040-09343-00	C1, C2, C4-C7, C10, C100, C106, C107, C120	10µf Cap., ±20%, Axial
5043-08980-00	C39-C45	.01µf Cap., +80%/-20%, Axial
5043-08996-00	C3, C52-C57, C61-C61, C69-C99, C121, C122	.1µf Cap., ±20%, Axial
5045-12926-00	C58-C60	.1µf Cap., ±10%, Axial Film
5048-11028-00	C27, C28	22pf Cap., ±20%, Axial
5048-13375-00	C11-C26	100pf Cap., ±20%, Axial
5048-13608-00	C51	6800pf Cap., 5%, Axial
5048-13609-00	C48-C50	3900pf Cap., 5%, Axial
5048-13610-00	C35-C38	1000pf Cap., ±20%, Axial
5048-13611-00	C101-C104	680pf Cap., ±20%, Axial
5070-08919-00	D5	Diode, 1N4148
01-10516		Heat Sink
5280-08974-00	U29	IC, 7406
5281-09486-00	U19	IC, 74LS374
5281-09487-00	U18	IC, 74LS74
5283-10551-00	U30	IC, 74F00
5311-10948-00	U11	IC, 74HC138
5311-12043-00	U35, U36	IC, 74HC174
5311-12287-00	U21-U23	IC, 74HC541
5311-12538-00	U38	IC, 74HC14
5320-13436-00	U24	IC, 74ACTQ245
5340-12958-00	U25-U27	IC, 26LS31
5340-12959-00	U12-U14	IC, 26LS32A
5340-13304-00	U32-U34	IC, SRAM, 2Kx8
5370-12730-00	U37	IC, TL084
5370-13308-00	U20	IC, MB3731 SIP
5371-13299-00	U16	IC, AD1851
5520-13301-00	Y2	10MHz Crystal
5551-09822-00	L3	4.7µH Inductor
5556-12513-00	L1, L2	Ferrite Bead
5671-13732-00	DS1	Display LED, Red
5700-12088-00	U2-U9	32-pin Socket
5700-12253-00	U1	68-pin Socket
5700-12047-00	U17	24-pin Socket
5791-09437-00	P4	100 C 10 x 2
5791-10862-02	P6, P7	2H Str Sq Pin .156
5791-10862-05	P3	5H Str Sq Pin .156
5791-10862-09	P1	9H Str Sq Pin .156
5400-13298-00	U1	IC, ADSP2105 PLCC
A-17481	U17	IC, PLD GAL20V8, 25ns
A-5343-40029-35	U2	EPROM
A-5343-40029-36	U3	EPROM
A-5354-40029-37	U4	EPROM
A-5343-40029-38	U5	EPROM
A-5343-40029-39	U6	EPROM
A-5343-40029-40	U7	EPROM

NOTES

MORTAL KOMBAT II
KIT

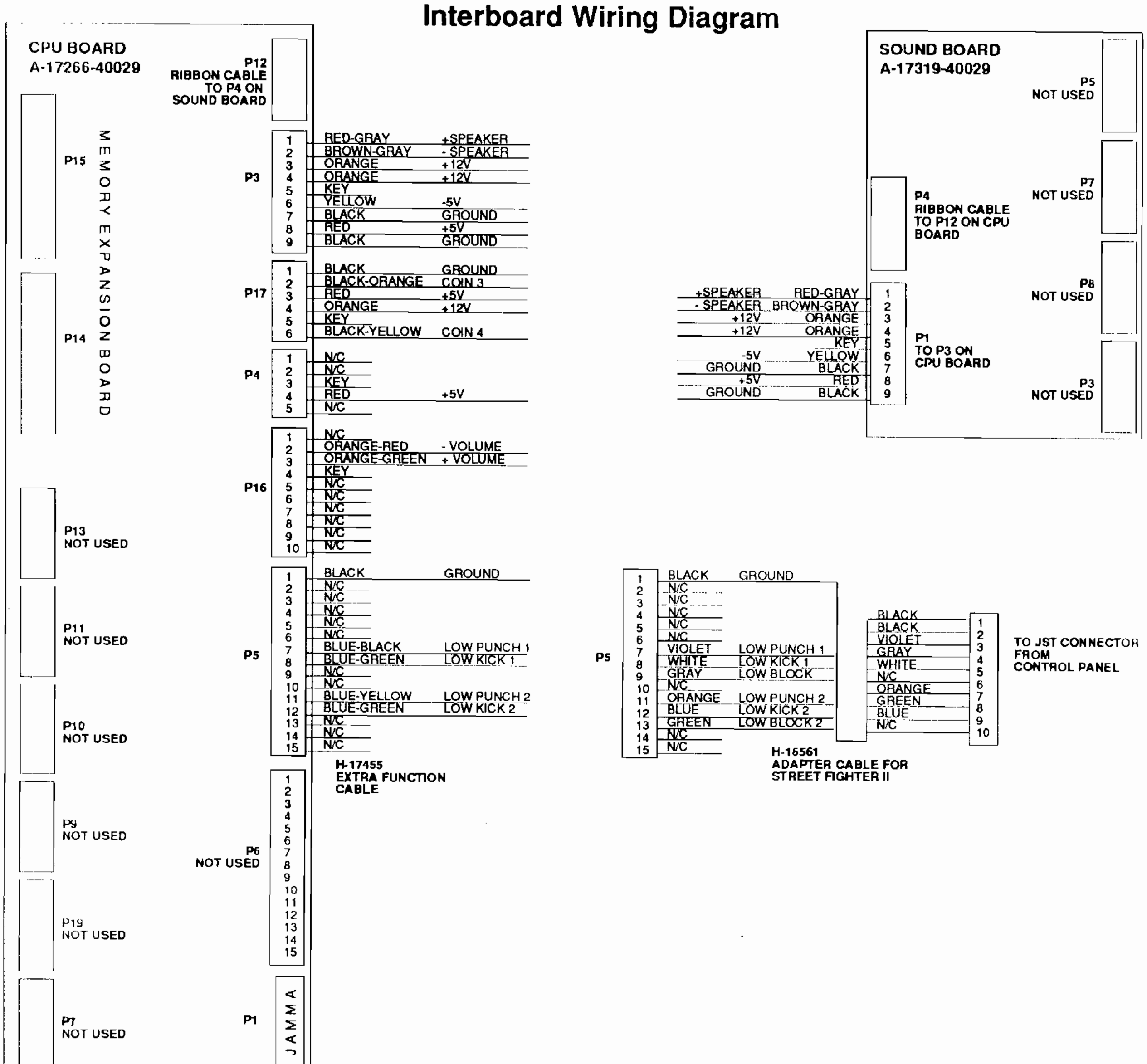
S E C T I O N
three

Schematics and Wiring Diagrams

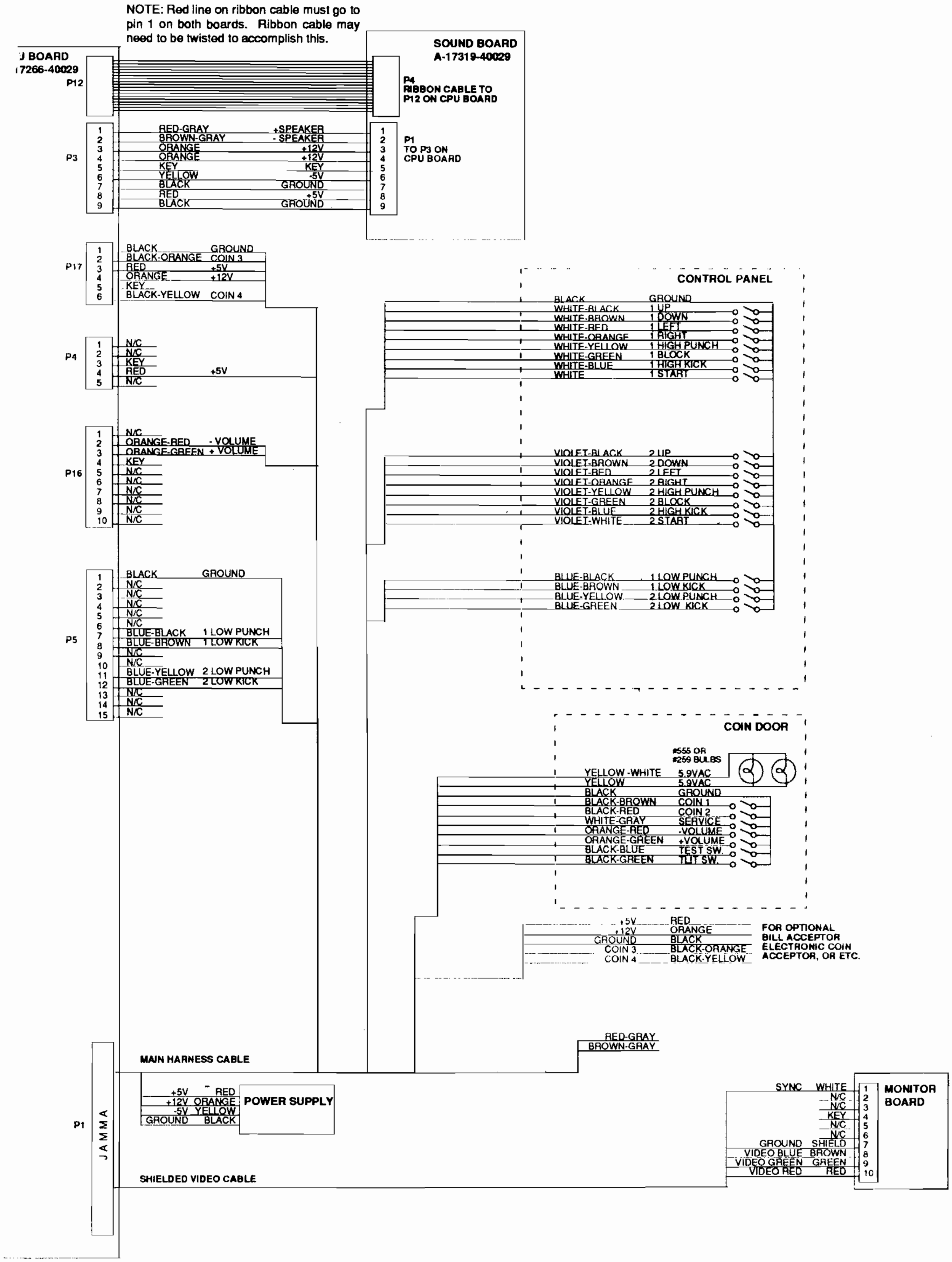
JAMMA Chart

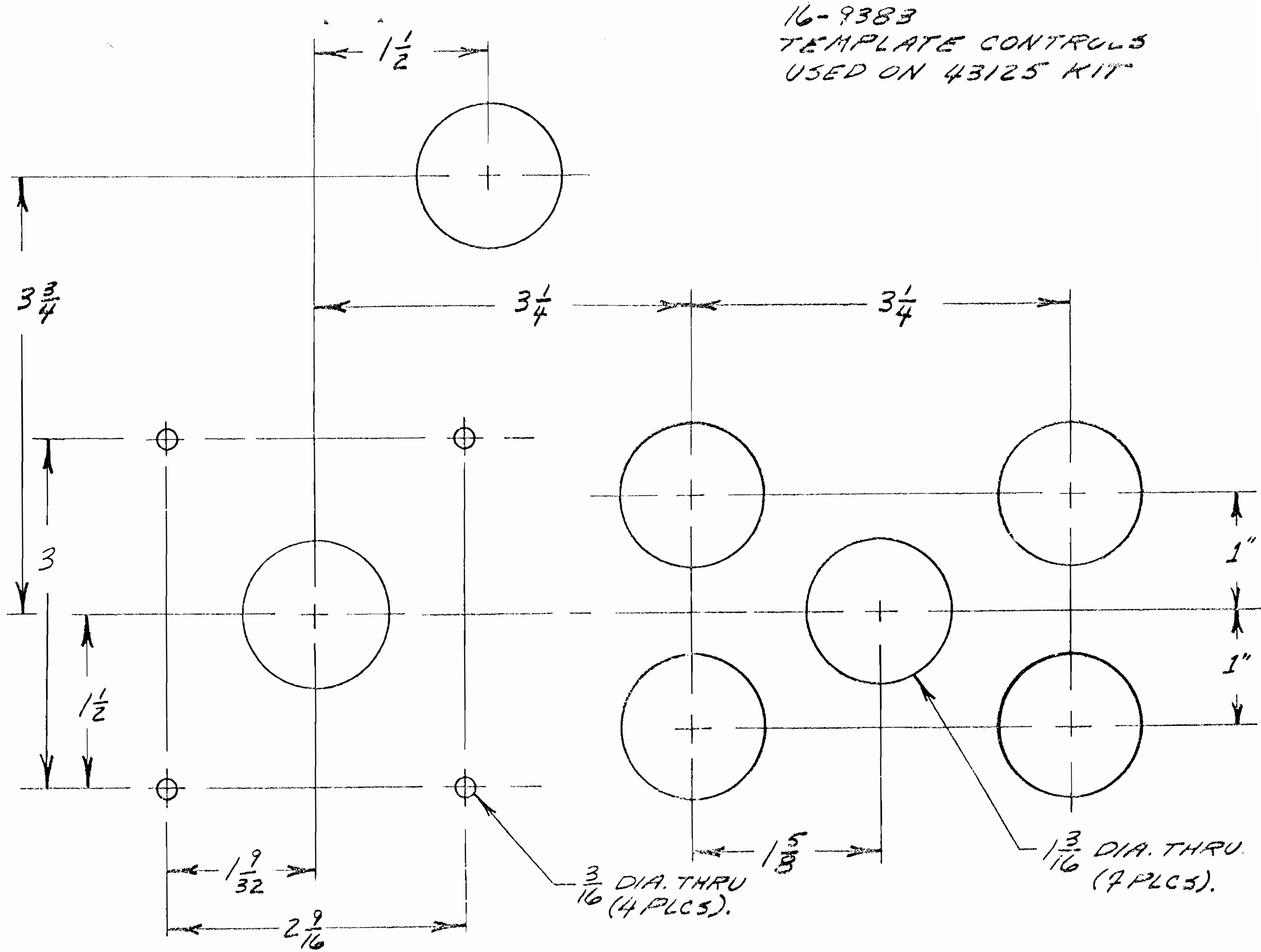
Function	Wire Color	Pin	Pin	Wire Color	Function
Ground	Black	1	A	Black	Ground
Ground	Black	2	B	Black	Ground
+5 Volts DC	Red	3	C	Red	+5 Volts DC
+5 Volts DC	Red	4	D	Red	+5 Volts DC
-5 Volts DC	Yellow	5	E	Yellow	-5 Volts DC
+12 Volts DC	Orange	6	F	Orange	+12 Volts DC
	Key	7	H	Key	
Meter 1	Brown-Red	8	J	Brown	Meter 2
	N/C	9	K	N/C	
Speaker (+)	Red-Gray	10	L	Brown-Gray	Speaker (-)
	N/C	11	M	N/C	
Video Red	Red	12	N	Green	Video Green
Video Blue	Brown	13	P	White	Video Sync
Video Ground	Shield	14	R	White-Gray	Service Switch
Test Switch	Black-Blue	15	S	Black-Green	Tilt Switch
Coin 1	Black-Brown	16	T	Black-Red	Coin 2
Start 1	White	17	U	Violet-White	Start 2
1 Up	White-Black	18	V	Violet-Black	2 Up
1 Down	White-Brown	19	W	Violet-Brown	2 Down
1 Left	White-Red	20	X	Violet-Red	2 Left
1 Right	White-Orange	21	Y	Violet-Orange	2 Right
1 High Punch	White-Yellow	22	Z	Violet-Yellow	2 High Punch
1 Block	White-Green	23	a	Violet-Green	2 Block
1 High Kick	White-Blue	24	b	Violet-Blue	2 High Kick
N/C	White-Violet	25	c	Violet	N/C
	N/C	26	d	N/C	
	N/C	27	e	N/C	
Ground	Black	28	f	Black	Ground

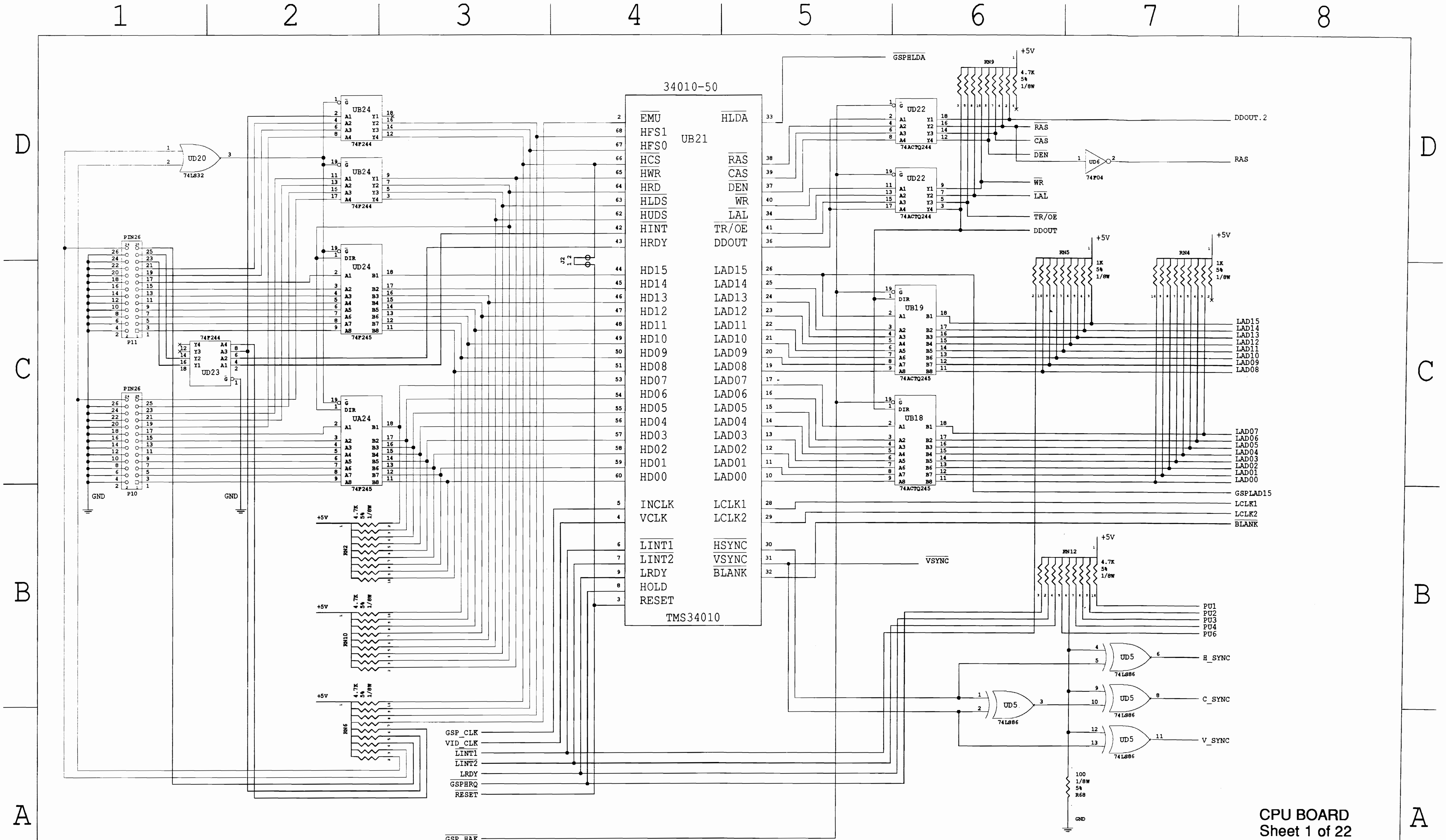
Interboard Wiring Diagram



Cabinet Wiring Diagram

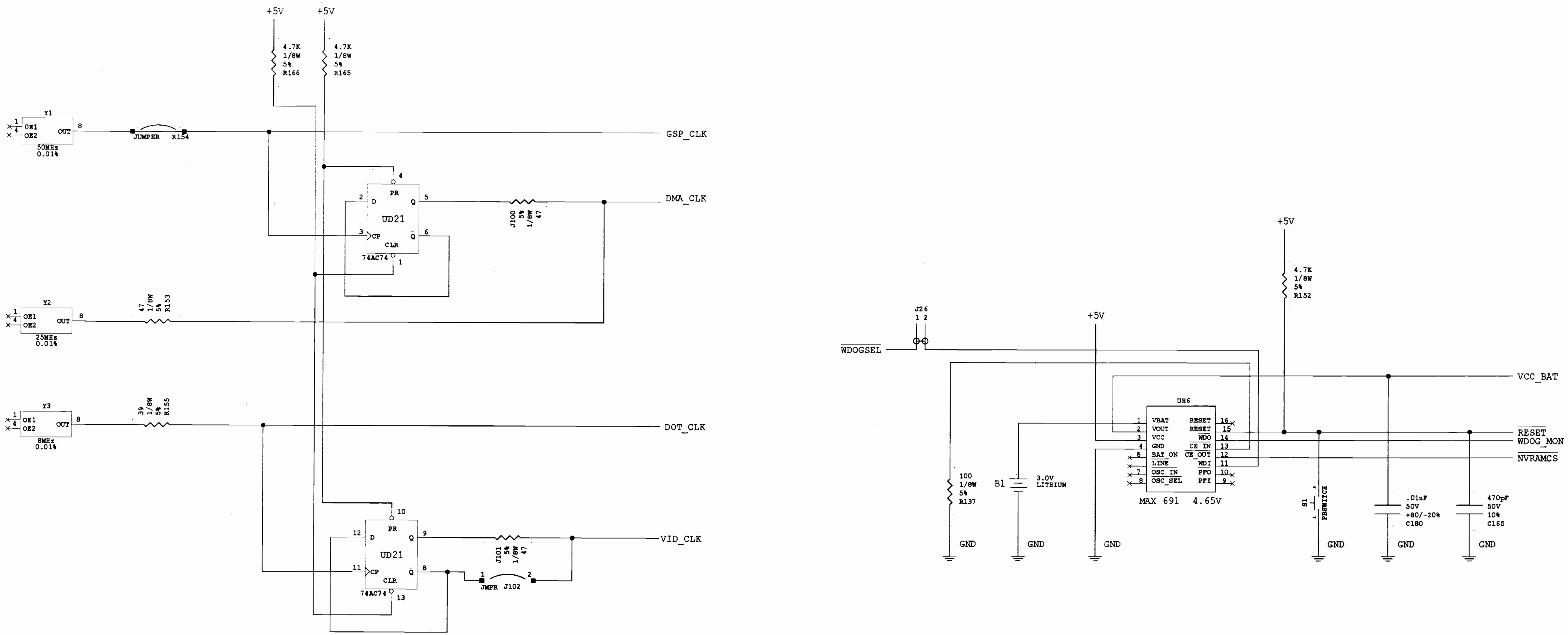



16-9383
TEMPLATE CONTROLS
USED ON 43125 KIT
1 1/2
3 3/4
3 1/4
3 1/4
3
1 1/2
1"
1"
1 9/32
2 9/16
1 5/8
3/16 DIA. THRU (4 PLCS).
1 3/16 DIA. THRU (7 PLCS).



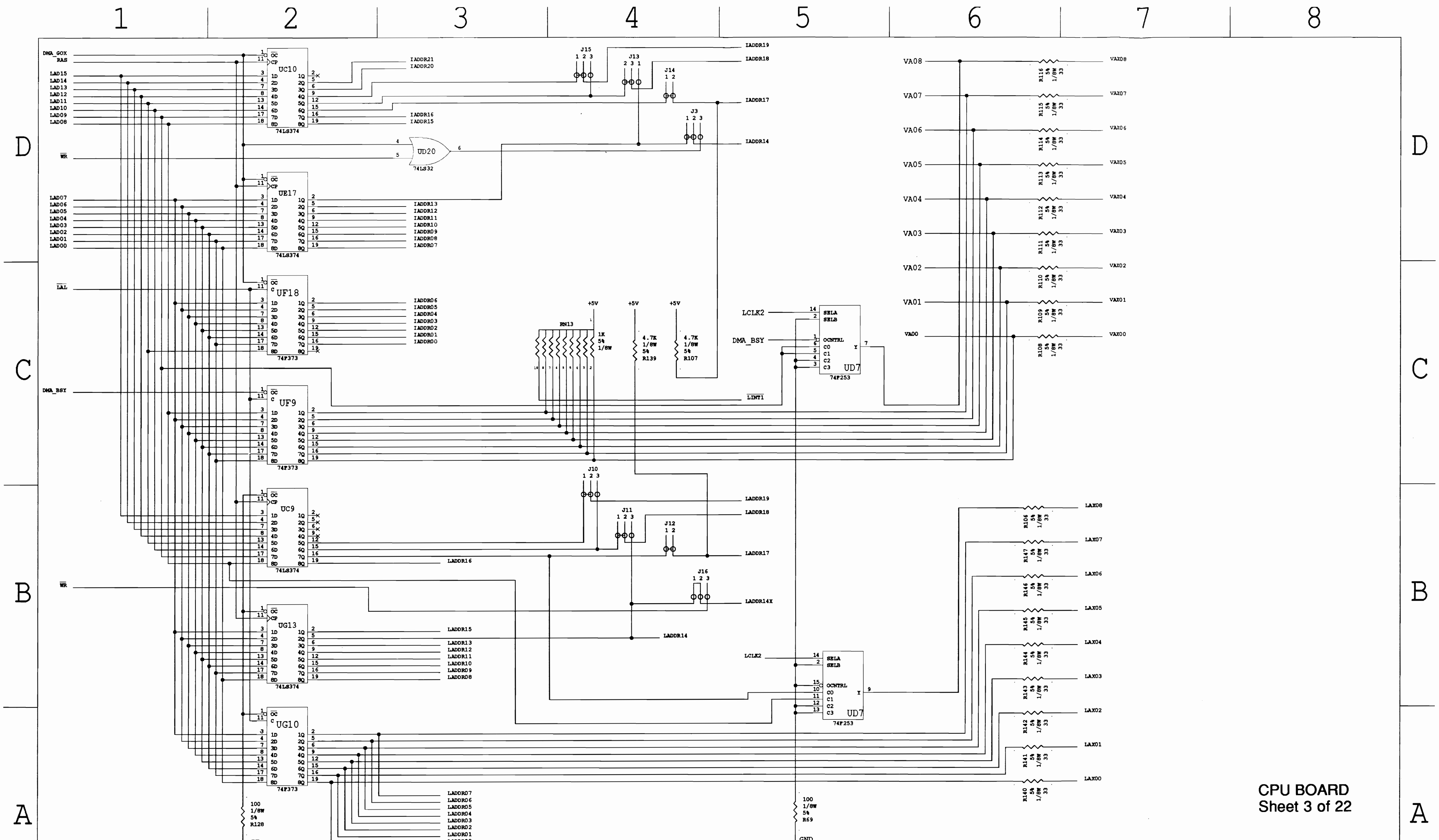
CPU BOARD
Sheet 1 of 22

PROJECT ENG. REM	FIRST PROJ. NO 40023 DATE 09DEC92	WILLIAMS ELECTRONICS AND GAMES INC. MIDWAY MANUFACTURING COMPANY 3401 N. CALIFORNIA AVE. CHICAGO IL.
DWN. BY REM DATE	FIRST USEAGE A-14816 DATE 09DEC92	TITLE 34010 PROCESSOR
CHECKED REM DATE	CURRENT PROJECT 40023 DATE 19AUG93	
APPROVED DATE	SHEET 01 OF 22	PART NO. 16-9470 REV. 5



CPU BOARD
Sheet 2 of 22

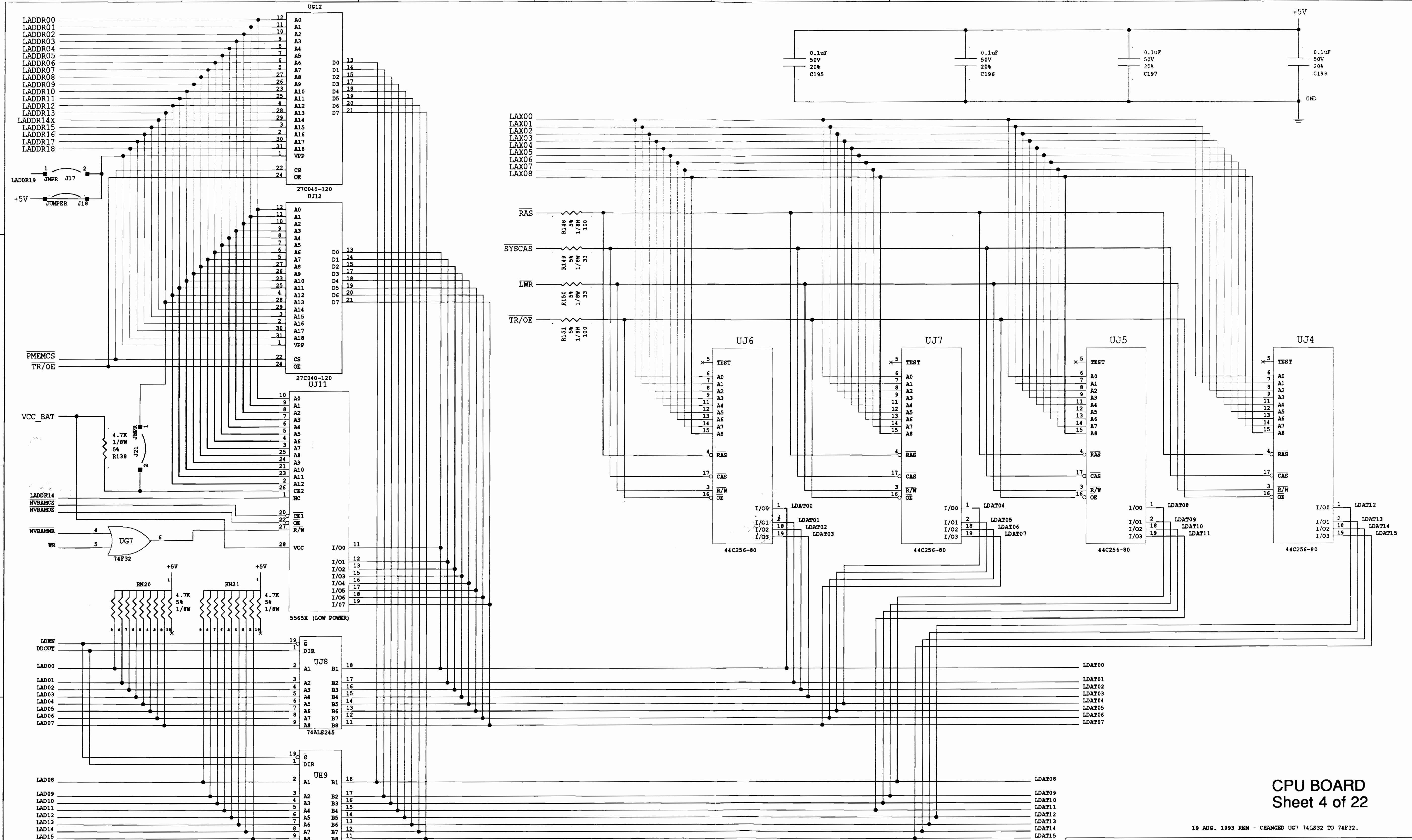
PROJECT ENG. REM	FIRST PROJ. NO 40023	DATE 09DEC92	WILLIAMS ELECTRONICS AND GAMES INC. MIDWAY MANUFACTURING COMPANY 3401 N. CALIFORNIA AVE. CHICAGO IL.
DWN. BY REM	FIRST USEAGE A-14816	DATE 09DEC92	TITLE
CHECKED REM	CURRENT PROJECT 40023	DATE 19AUG93	CLOCK GENERATION/POWER MONITOR
APPROVED	SHEET 02	OF 22	PART NO. 16-9470 REV. 5



CPU BOARD
Sheet 3 of 22

INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.

PROJECT ENG.		FIRST PROJ. NO	DATE	WILLIAMS ELECTRONICS AND GAMES INC.
REM		40023	09DEC92	MIDWAY MANUFACTURING COMPANY
DWN. BY	DATE	FIRST USEAGE	DATE	3401 N. CALIFORNIA AVE. CHICAGO IL.
REM		A-14816	09DEC92	TITLE
CHECKED	DATE	CURRENT PROJECT	DATE	ADDRESS GENERATION/BUFFERS
REM		40023	19AUG93	
APPROVED	DATE	SHEET 03	OF 22	PART NO. 16-9470 REV. 5



CPU BOARD
Sheet 4 of 22

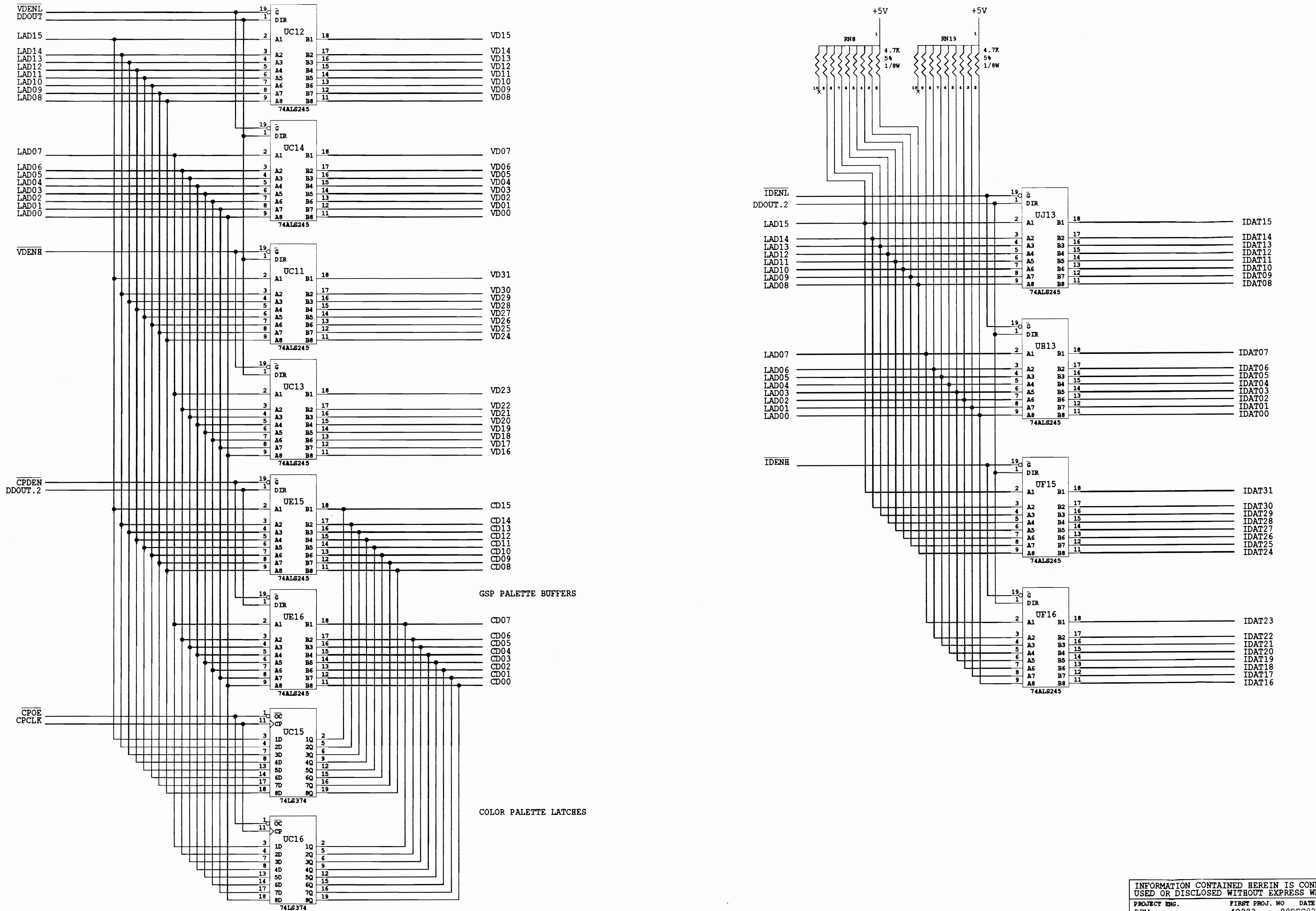
19 AUG. 1993 REM - CHANGED UG7 74LS32 TO 74F32.

PROJECT ENG. REM		FIRST PROJ. NO 40023	DATE 09DEC92
DWN. BY REM	DATE	FIRST USEAGE A-14186	DATE 09DEC92
CHECKED REM	DATE	CURRENT PROJECT 40023	DATE 19AUG93
APPROVED	DATE	SHEET 04	OF 22

WILLIAMS ELECTRONICS AND GAMES INC.
MIDWAY MANUFACTURING COMPANY
3401 N. CALIFORNIA AVE. CHICAGO IL.

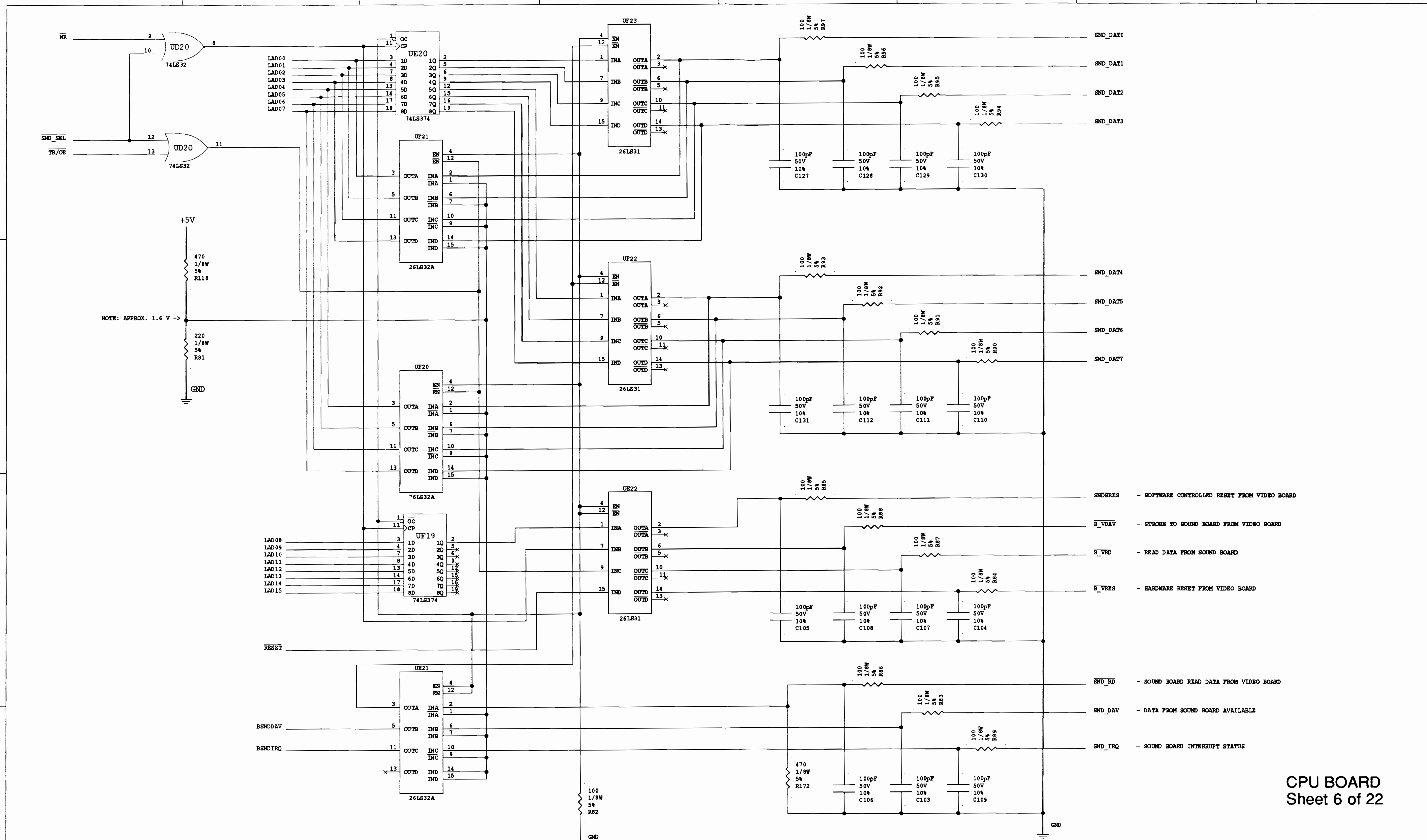
TITLE: SYSTEM MEMORY

PART NO. 16-9470 REV. 5



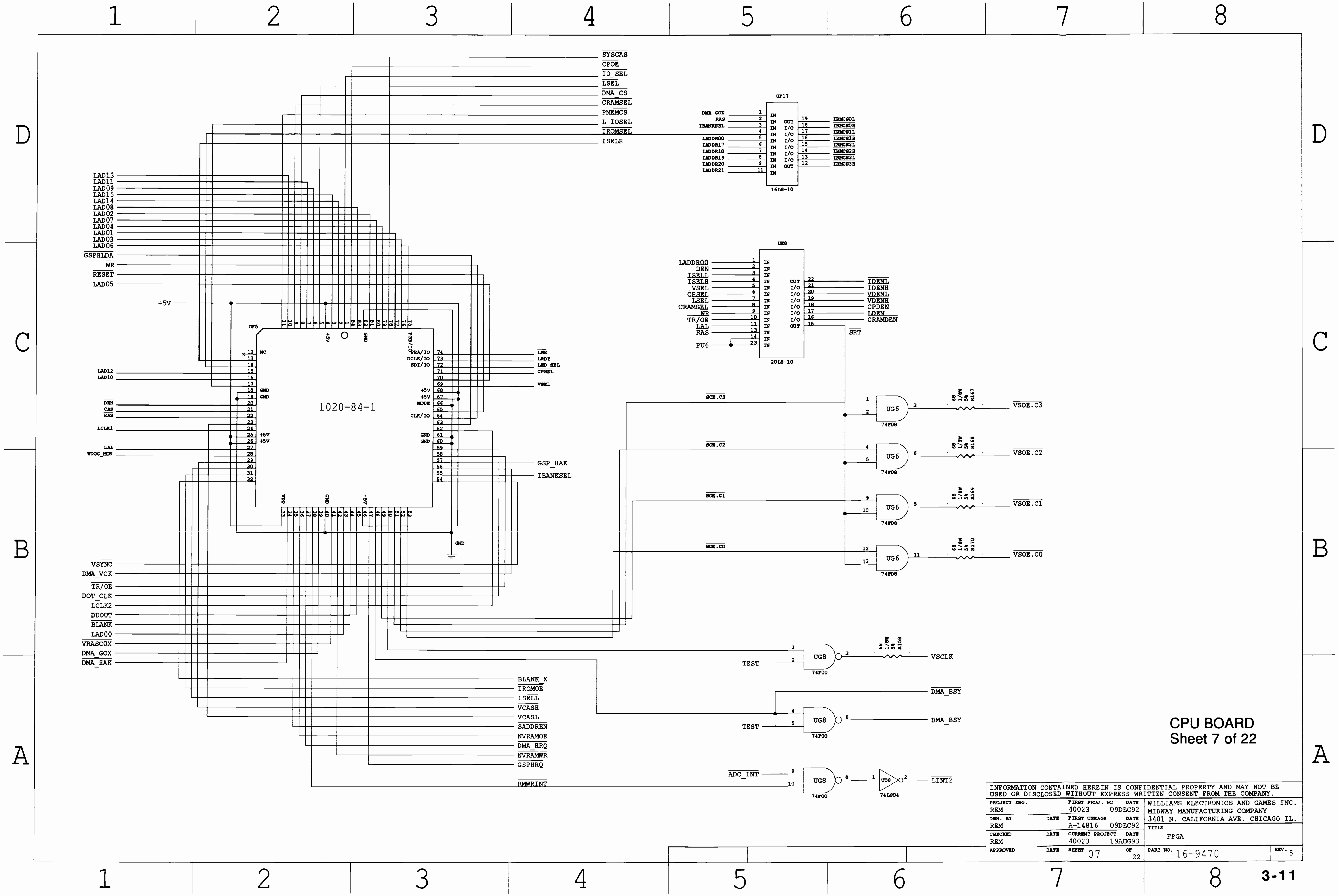
CPU BOARD
Sheet 5 of 22

PROJECT ENG. REM		FIRST PROJ. NO 40023	DATE 09DEC92	WILLIAMS ELECTRONICS AND GAMES INC. MIDWAY MANUFACTURING COMPANY 3401 N. CALIFORNIA AVE. CHICAGO IL.
DWN. BY REM	DATE	FIRST USEAGE A-14816	DATE 09DEC92	TITLE IMAGE/VIDEO MEMORY DATA BUFFERS
CHECKED REM	DATE	CURRENT PROJECT 40023	DATE 19AUG93	
APPROVED	DATE	SHEET 05	OF 22	PART NO. 16-9470 REV. 5

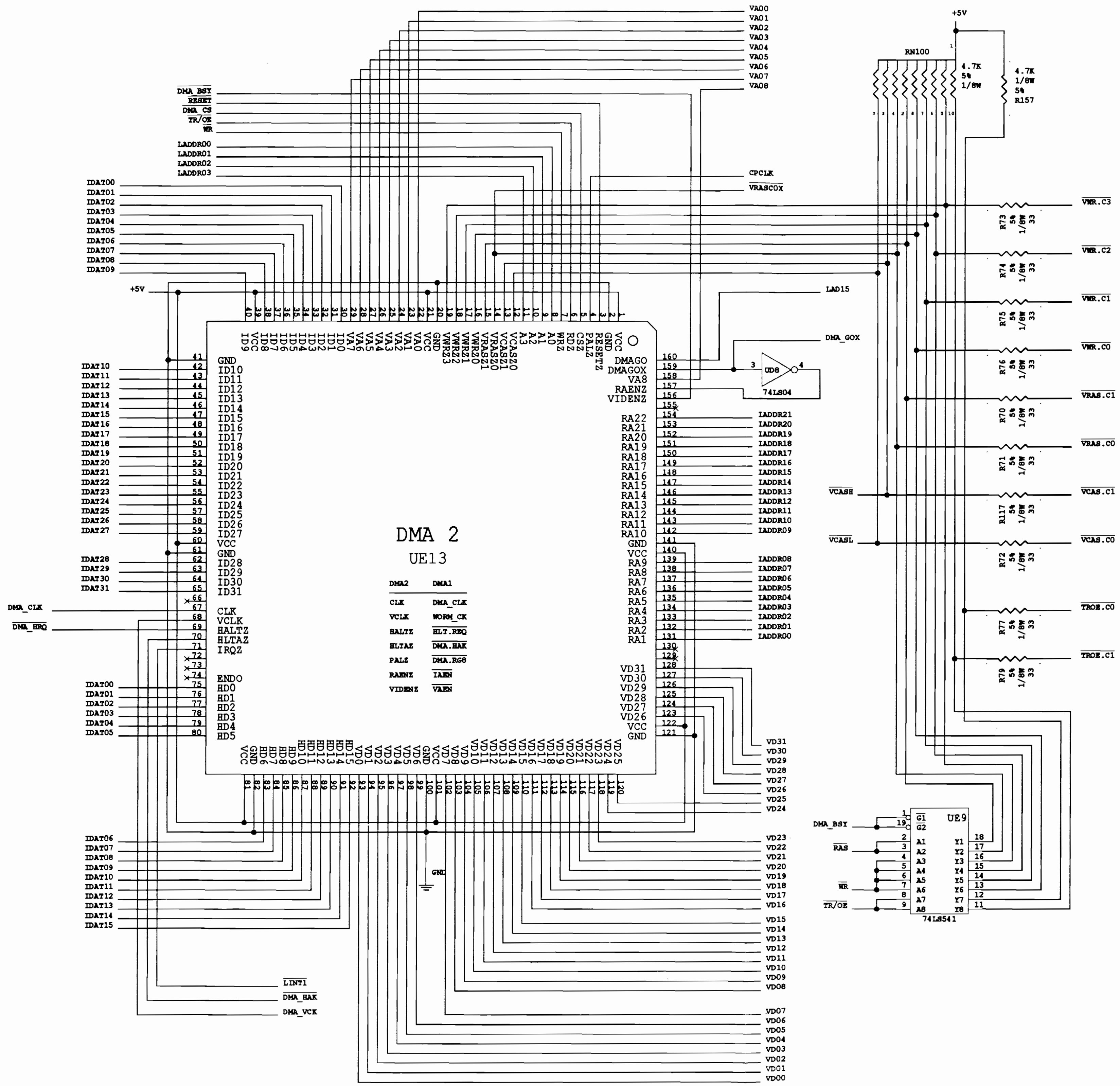


INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.

PROJECT ENG. REM	FIRST PROJ. NO 40023	DATE 09DEC92	WILLIAMS ELECTRONICS AND GAMES INC. MIDWAY MANUFACTURING COMPANY 3401 N. CALIFORNIA AVE. CHICAGO IL.
DWN. BY REM	FIRST USEAGE A-14816	DATE 09DEC92	TITLE SOUND INTERFACE
CHECKED REM	CURRENT PROJECT 40023	DATE 19AUG93	
APPROVED	SHEET 06	OF 22	PART NO. 16-9470 REV. 5



CPU BOARD
Sheet 7 of 22
1020-84-1
UF5
UF17
16L8-10
UE8
20L8-10
SYSCAS
CPOE
IO_SEL
LSEL
DMA_CS
CRAMSEL
PMEMCS
L_IOSEL
IROMSEL
ISELH
LAD13
LAD11
LAD09
LAD15
LAD14
LAD08
LAD02
LAD07
LAD04
LAD01
LAD03
LAD06
GSPHLDA
WR
RESET
LAD05
+5V
LAD12
LAD10
DEN
CAS
RAS
LCLK1
LAL
WDOG_MON
LWR
LRDY
LED_SEL
CPSEL
VSEL
GSP_HAK
IBANKSEL
GND
VSYNC
DMA_VCK
TR/OE
DOT_CLK
LCLK2
DDOUT
BLANK
LAD00
VRASCOX
DMA_GOX
DMA_HAK
BLANK_X
IROMOE
ISELL
VCASH
VCASL
SADDREN
NVRAMOE
DMA_HRQ
NVRAMWR
GSPHRQ
RMWRINT
LADDR00
DEN
ISELL
ISELH
VSEL
CPSEL
LSEL
CRAMSEL
WR
TR/OE
LAL
RAS
PU6
IDENL
IDENH
VDENL
VDENH
CPDEN
LDEN
CRAMDEN
SRT
UG6
74F08
VSOE.C3
VSOE.C2
VSOE.C1
VSOE.C0
UG8
74F00
TEST
VSCLK
DMA_BSY
ADC_INT
UD8
74LS04
LINT2
INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.
PROJECT ENG. REM
FIRST PROJ. NO 40023 DATE 09DEC92
DWN. BY REM
FIRST USAGE A-14816 DATE 09DEC92
CHECKED REM
CURRENT PROJECT 40023 DATE 19AUG93
APPROVED
SHEET 07 OF 22
WILLIAMS ELECTRONICS AND GAMES INC.
MIDWAY MANUFACTURING COMPANY
3401 N. CALIFORNIA AVE. CHICAGO IL.
TITLE FPGA
PART NO. 16-9470
REV. 5



CPU BOARD
Sheet 8 of 22

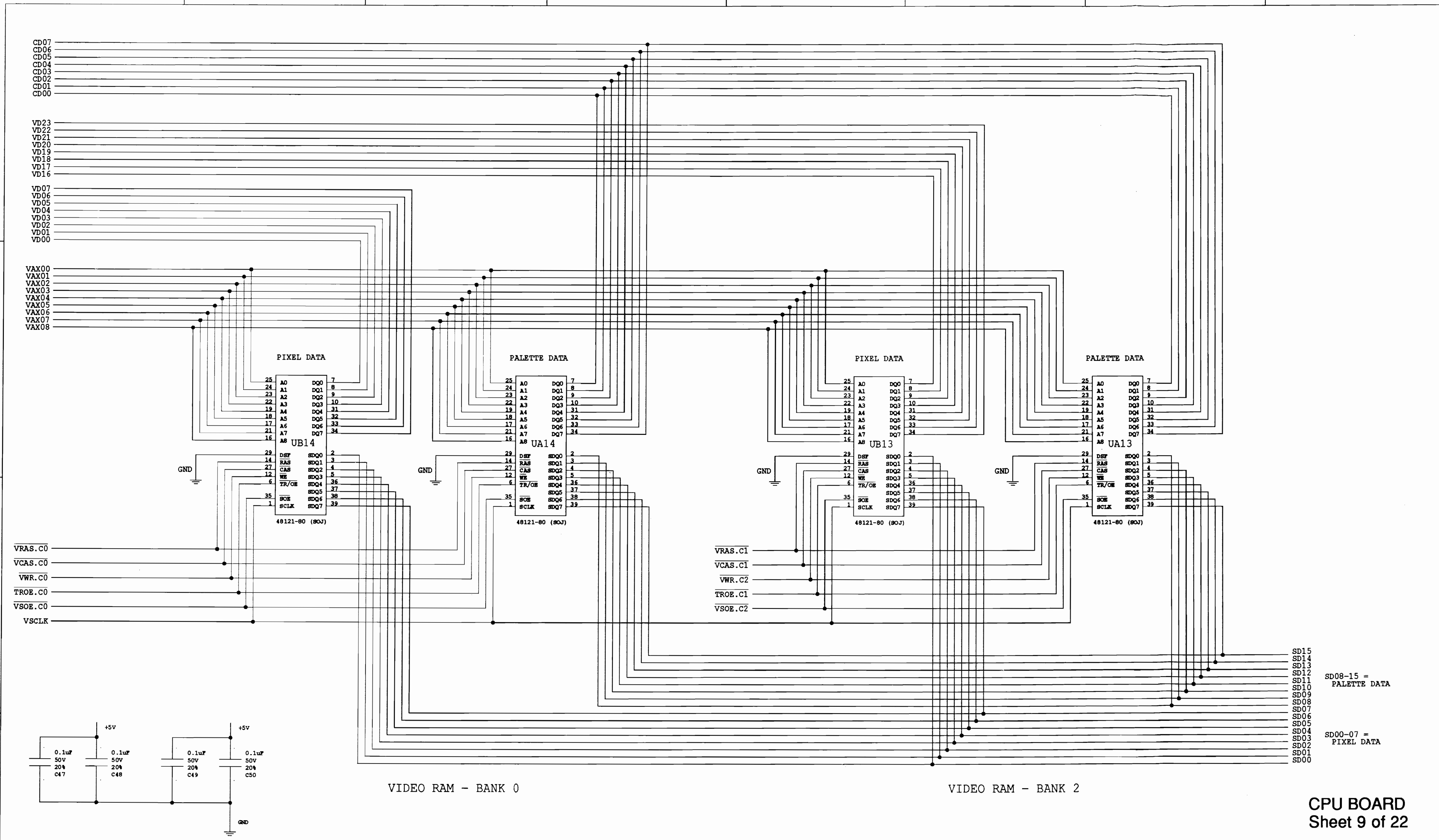
INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.

PROJECT ENG. REM		FIRST PROJ. NO 40023	DATE 09DEC92
DWN. BY REM	DATE	FIRST USEAGE A-14816	DATE 09DEC92
CHECKED REM	DATE	CURRENT PROJECT 40023	DATE 19AUG93
APPROVED	DATE	SHEET 08	OF 22

WILLIAMS ELECTRONICS AND GAMES INC.
MIDWAY MANUFACTURING COMPANY
3401 N. CALIFORNIA AVE. CHICAGO IL.

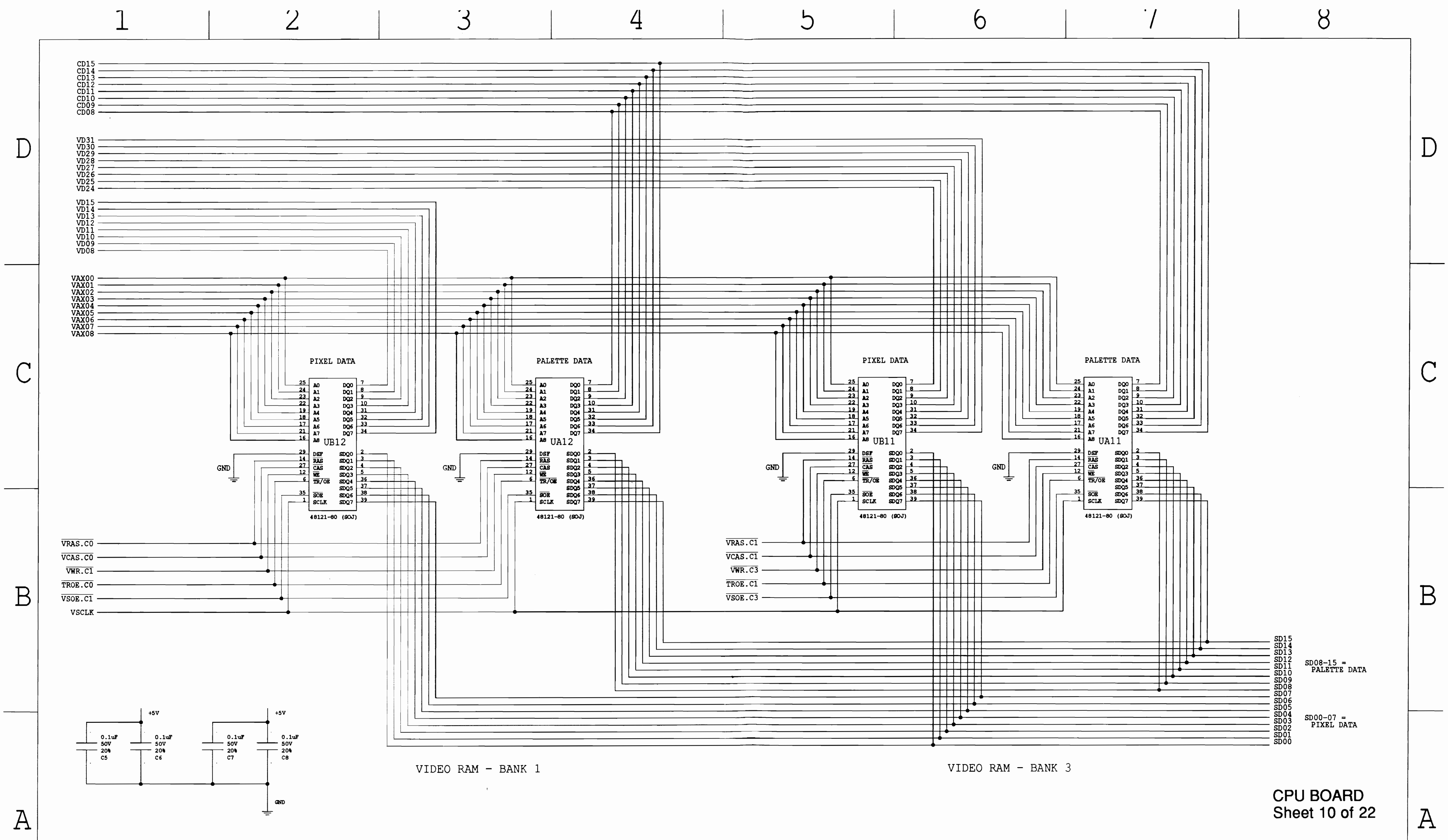
TITLE DMA

PART NO. 16-9470 REV. 5



CPU BOARD
Sheet 9 of 22

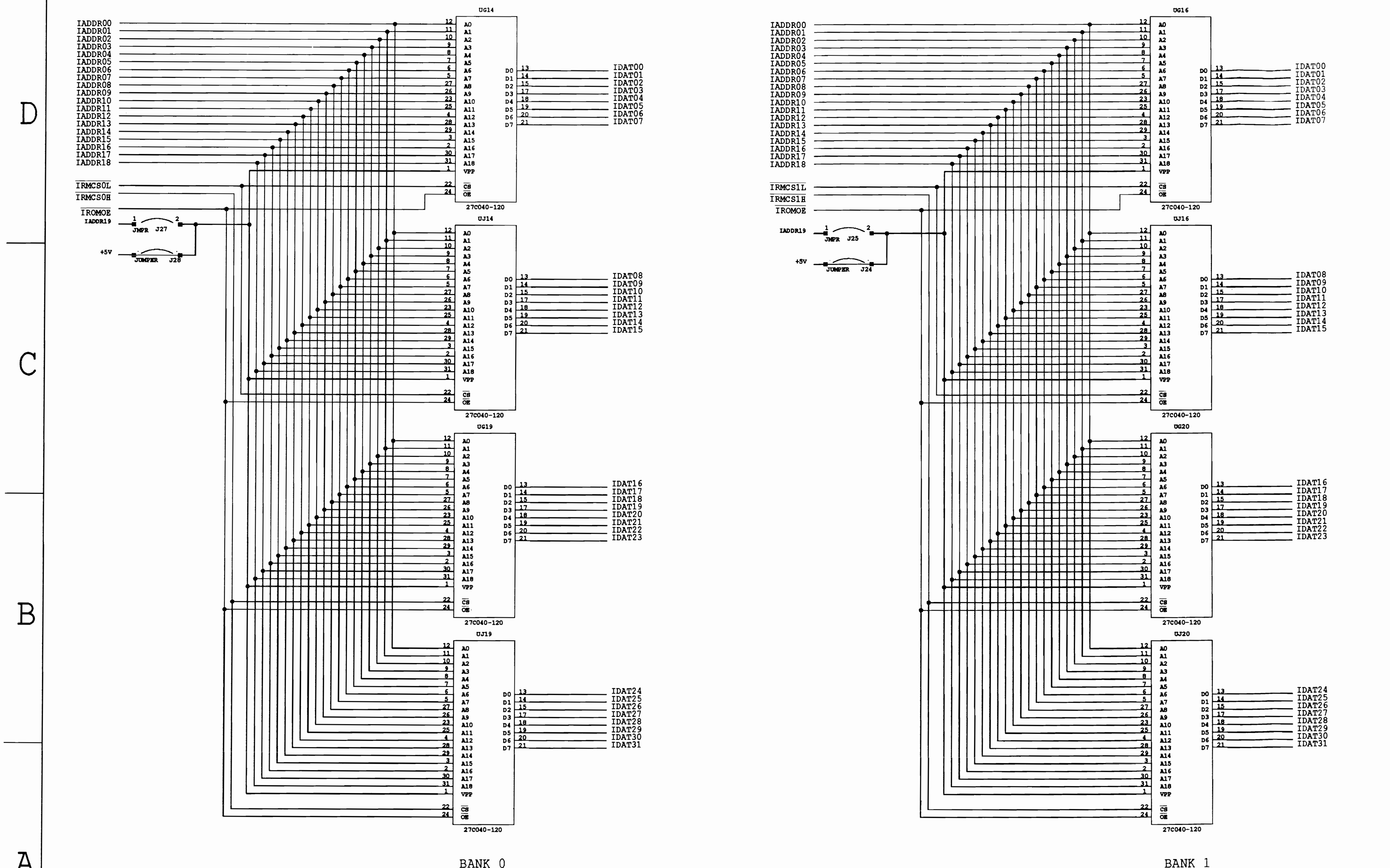
PROJECT ENG. REM	FIRST PROJ. NO 40023	DATE 09DEC92	WILLIAMS ELECTRONICS AND GAMES INC. MIDWAY MANUFACTURING COMPANY 3401 N. CALIFORNIA AVE. CHICAGO IL.
DWN. BY REM	FIRST USAGE A-14816	DATE 09DEC92	TITLE VIDEO RAM BANK 0/BANK 2
CHECKED REM	CURRENT PROJECT 40023	DATE 19AUG93	
APPROVED	SHEET 09	OF 22	PART NO. 16-9470 REV. 5



CPU BOARD
Sheet 10 of 22

INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.

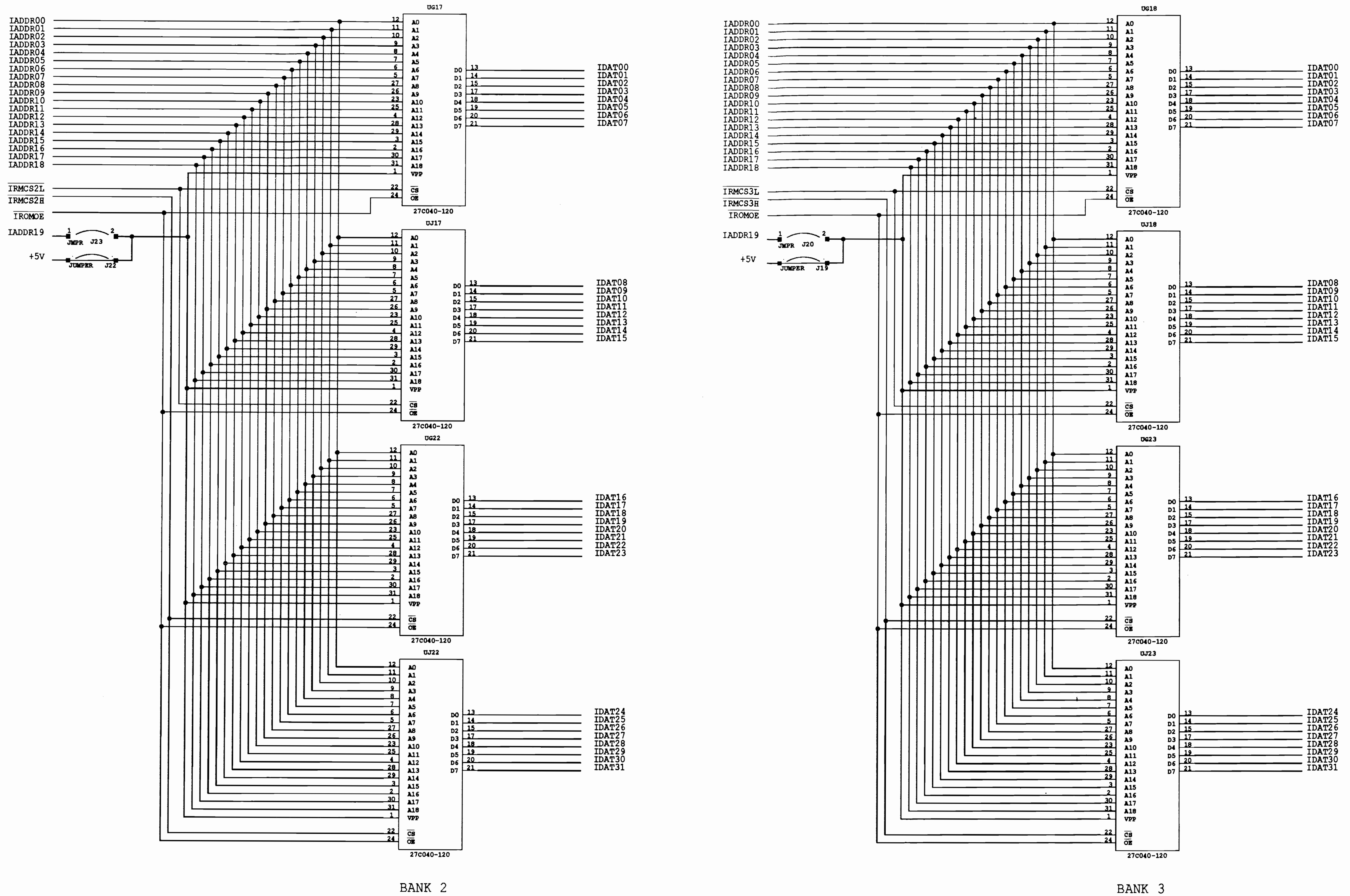
PROJECT ENG. REM	FIRST PROJ. NO 40023	DATE 09DEC92	WILLIAMS ELECTRONICS AND GAMES INC. MIDWAY MANUFACTURING COMPANY 3401 N. CALIFORNIA AVE. CHICAGO IL.
DWN. BY REM	FIRST USEAGE A-14816	DATE 09DEC92	
CHECKED REM	CURRENT PROJECT 40023	DATE 19AUG93	TITLE VIDEO RAM BANK 1/BANK 3
APPROVED	SHEET 10	OF 22	PART NO. 16-9470 REV. 5



CPU BOARD
Sheet 11 of 22

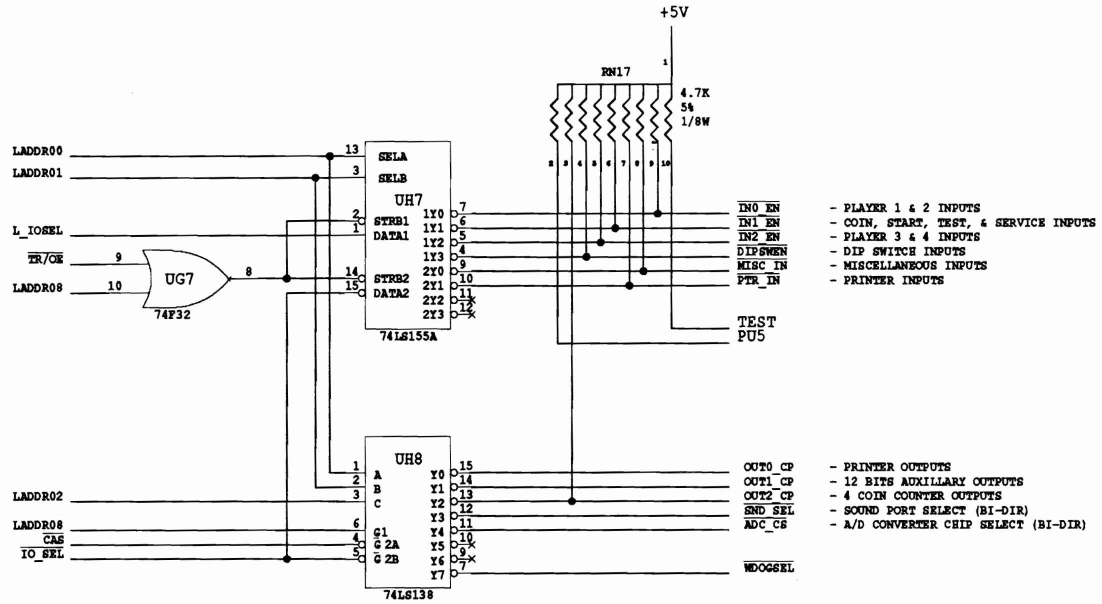
INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.

PROJECT ENG. REM		FIRST PROJ. NO 40023 / DATE 09DEC92	WILLIAMS ELECTRONICS AND GAMES INC. MIDWAY MANUFACTURING COMPANY 3401 N. CALIFORNIA AVE. CHICAGO IL.
DWN. BY REM	DATE	FIRST USEAGE A-14816 / DATE 09DEC92	TITLE IMAGE ROM BANK 0/BANK 1
CHECKED REM	DATE	CURRENT PROJECT 40023 / DATE 19AUG93	
APPROVED	DATE	SHEET 11 OF 22	PART NO. 16-9470 REV. 5



CPU BOARD
Sheet 12 of 22

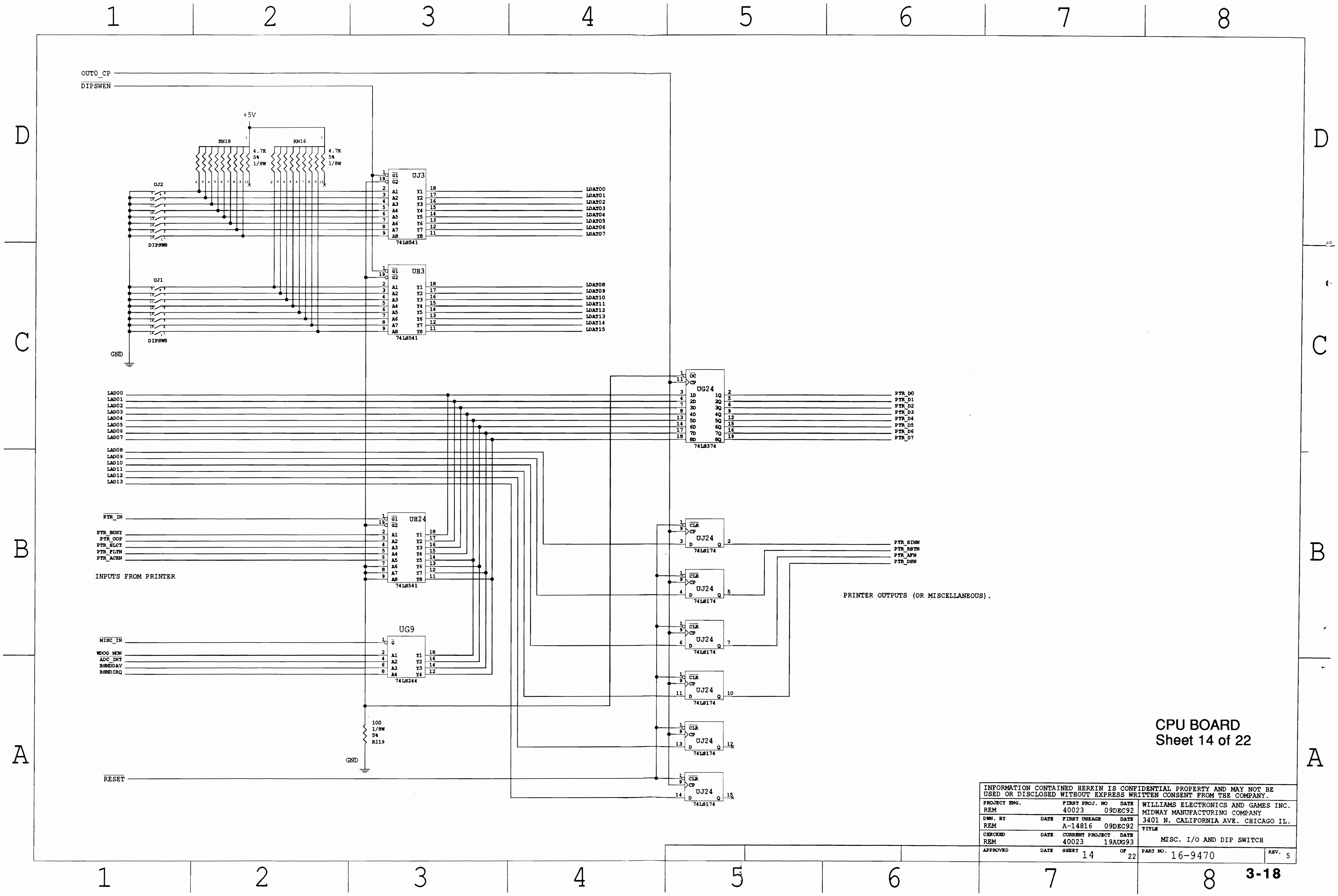
PROJECT ENG. REM	FIRST PROJ. NO 40023	DATE 09DEC92	WILLIAMS ELECTRONICS AND GAMES INC. MIDWAY MANUFACTURING COMPANY 3401 N. CALIFORNIA AVE. CHICAGO IL.
DWN. BY REM	DATE	FIRST USEAGE A-14816 DATE 09DEC92	TITLE IMAGE ROM BANK 2/BANK 3
CHECKED REM	DATE	CURRENT PROJECT 40023 DATE 19AUG93	
APPROVED	DATE	SHEET 12 OF 22	PART NO. 16-9470 REV. 5



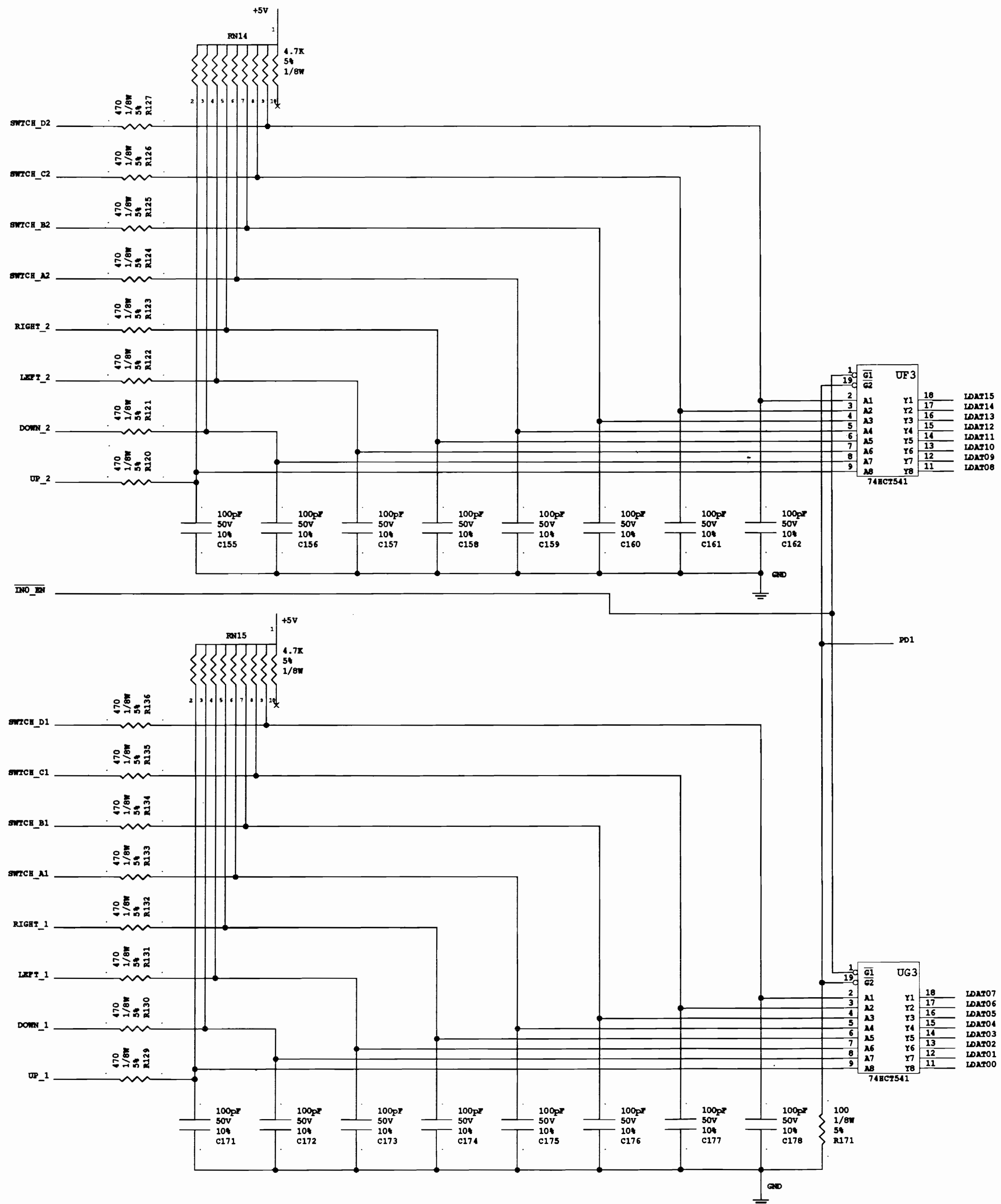
CPU BOARD
Sheet 13 of 22

19 AUG. 1993 REM - CHANGED UG7 74LS32 TO 74F32.

PROJECT ENG. REM	FIRST PROJ. NO 40023 DATE 09DEC92	WILLIAMS ELECTRONICS AND GAMES INC. MIDWAY MANUFACTURING COMPANY 3401 N. CALIFORNIA AVE. CHICAGO IL.	
DWN. BY REM DATE	FIRST USEAGE A-14816 DATE 09DEC92	TITLE I/O DECODING	
CHECKED REM DATE	CURRENT PROJECT 40023 DATE 19AUG93		
APPROVED DATE	SHEET 13 OF 22	PART NO. 16-9470	REV. 5

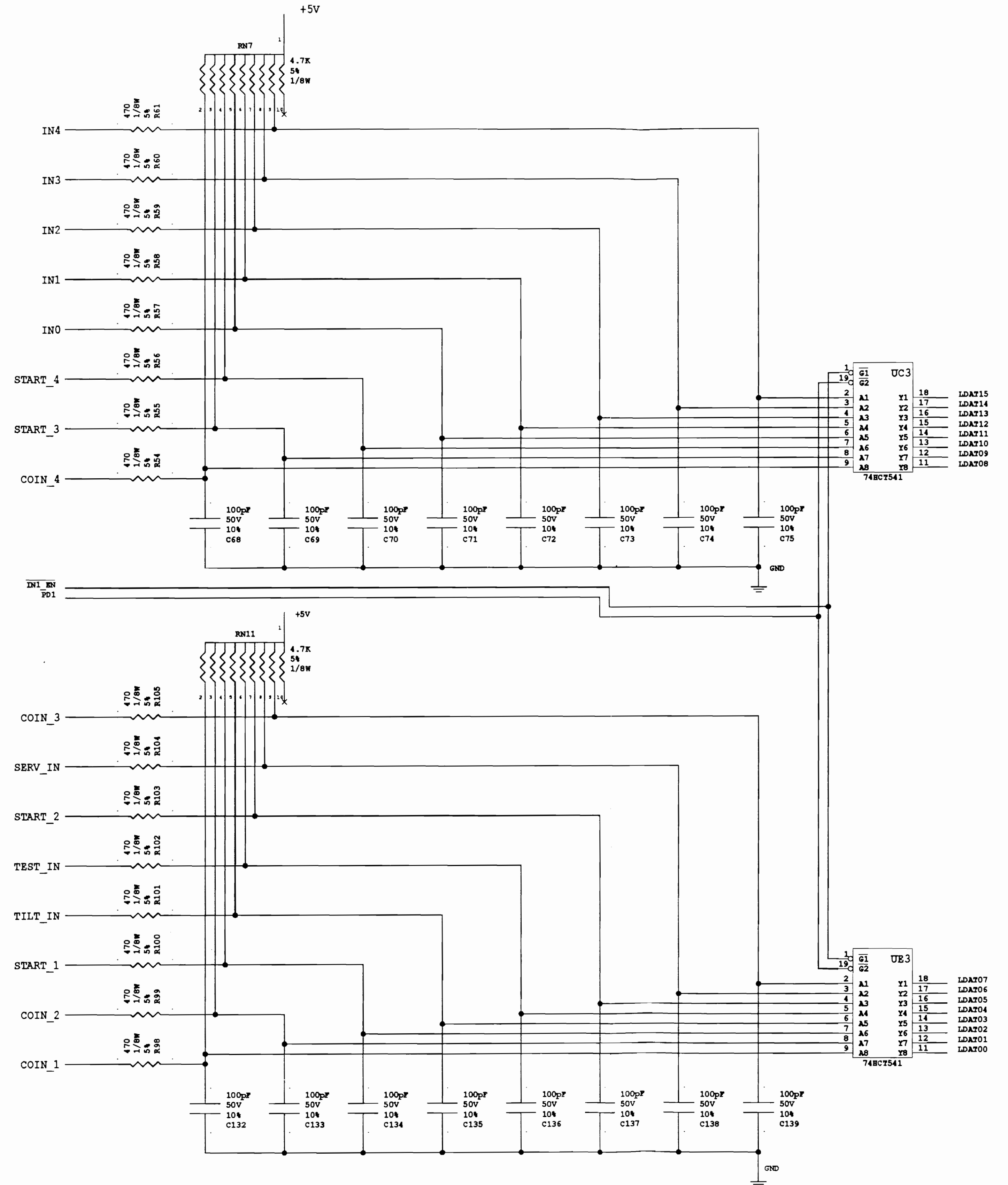


OUT0_CP
DIPSWEN
+5V
RN18
RN16
4.7K
5%
1/8W
UJ2
UJ1
DIPSW8
GND
UJ3
UH3
74LS541
LDAT00
LDAT01
LDAT02
LDAT03
LDAT04
LDAT05
LDAT06
LDAT07
LDAT08
LDAT09
LDAT10
LDAT11
LDAT12
LDAT13
LDAT14
LDAT15
LAD00
LAD01
LAD02
LAD03
LAD04
LAD05
LAD06
LAD07
LAD08
LAD09
LAD10
LAD11
LAD12
LAD13
UG24
74LS374
PTR_D0
PTR_D1
PTR_D2
PTR_D3
PTR_D4
PTR_D5
PTR_D6
PTR_D7
PTR_IN
PTR_BUSY
PTR_OOP
PTR_SLCT
PTR_FLTN
PTR_ACKN
INPUTS FROM PRINTER
UH24
UG9
74LS244
MISC_IN
WDOG_MON
ADC_INT
BSNDDAV
BSNDIRQ
UJ24
74LS174
PTR_SINN
PTR_RSTN
PTR_AFN
PTR_DSN
PRINTER OUTPUTS (OR MISCELLANEOUS).
100
1/8W
5%
R119
RESET
CPU BOARD
Sheet 14 of 22
INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.
PROJECT ENG. REM
FIRST PROJ. NO 40023 DATE 09DEC92
DWN. BY REM
FIRST USEAGE A-14816 DATE 09DEC92
CHECKED REM
CURRENT PROJECT 40023 DATE 19AUG93
APPROVED
SHEET 14 OF 22
WILLIAMS ELECTRONICS AND GAMES INC.
MIDWAY MANUFACTURING COMPANY
3401 N. CALIFORNIA AVE. CHICAGO IL.
TITLE
MISC. I/O AND DIP SWITCH
PART NO. 16-9470
REV. 5



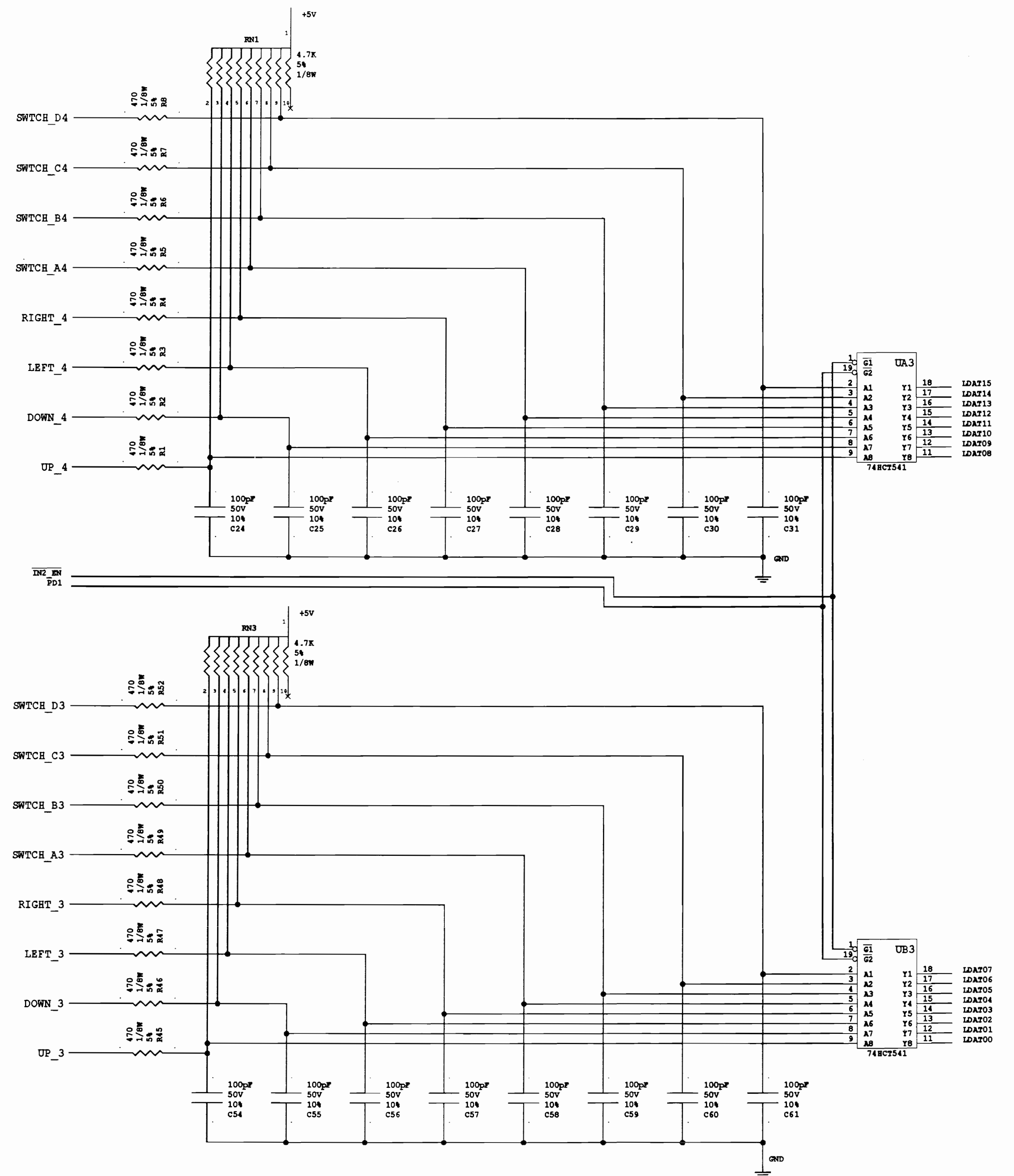
CPU BOARD
Sheet 15 of 22

PROJECT ENG. REM		FIRST PROJ. NO 40023 DATE 09DEC92	WILLIAMS ELECTRONICS AND GAMES INC. MIDWAY MANUFACTURING COMPANY 3401 N. CALIFORNIA AVE. CHICAGO IL.
DWN. BY REM	DATE	FIRST USEAGE A-14816 DATE 09DEC92	TITLE PLAYER 1/PLAYER 2 INPUTS
CHECKED REM	DATE	CURRENT PROJECT 40023 DATE 19AUG93	
APPROVED	DATE	SHEET 15 OF 22	PART NO. 16-9470 REV. 5



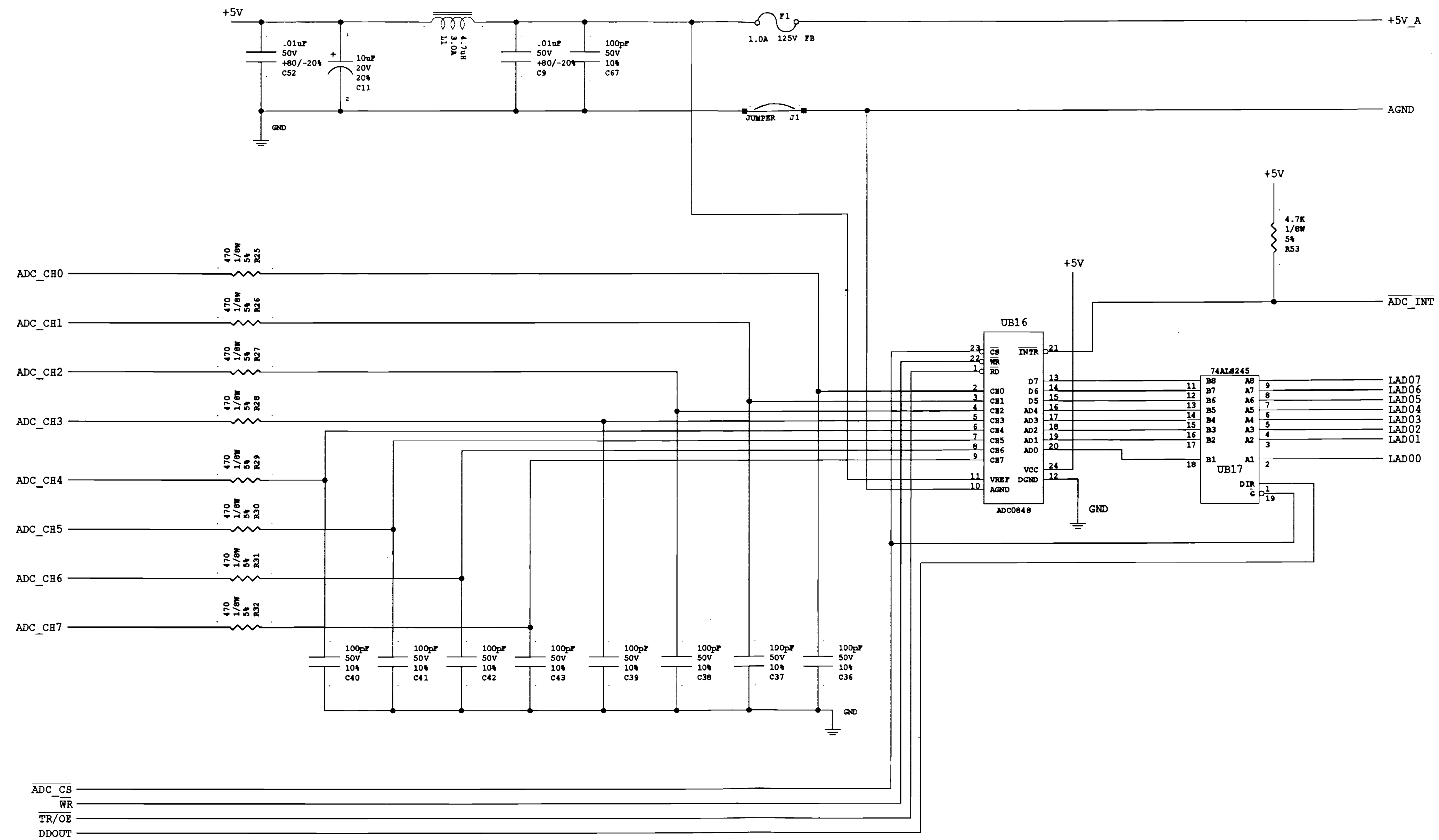
CPU BOARD
Sheet 16 of 22

PROJECT ENG. REM	FIRST PROJ. NO 40023	DATE 09DEC92	WILLIAMS ELECTRONICS AND GAMES INC. MIDWAY MANUFACTURING COMPANY 3401 N. CALIFORNIA AVE. CHICAGO IL.
DWN. BY REM / DATE	FIRST USEAGE A-14816	DATE 09DEC92	TITLE EXTRA INPUTS/COIN/START
CHECKED REM / DATE	CURRENT PROJECT 40023	DATE 19AUG93	
APPROVED / DATE	SHEET 16	OF 22	PART NO. 16-9470 / REV. 5



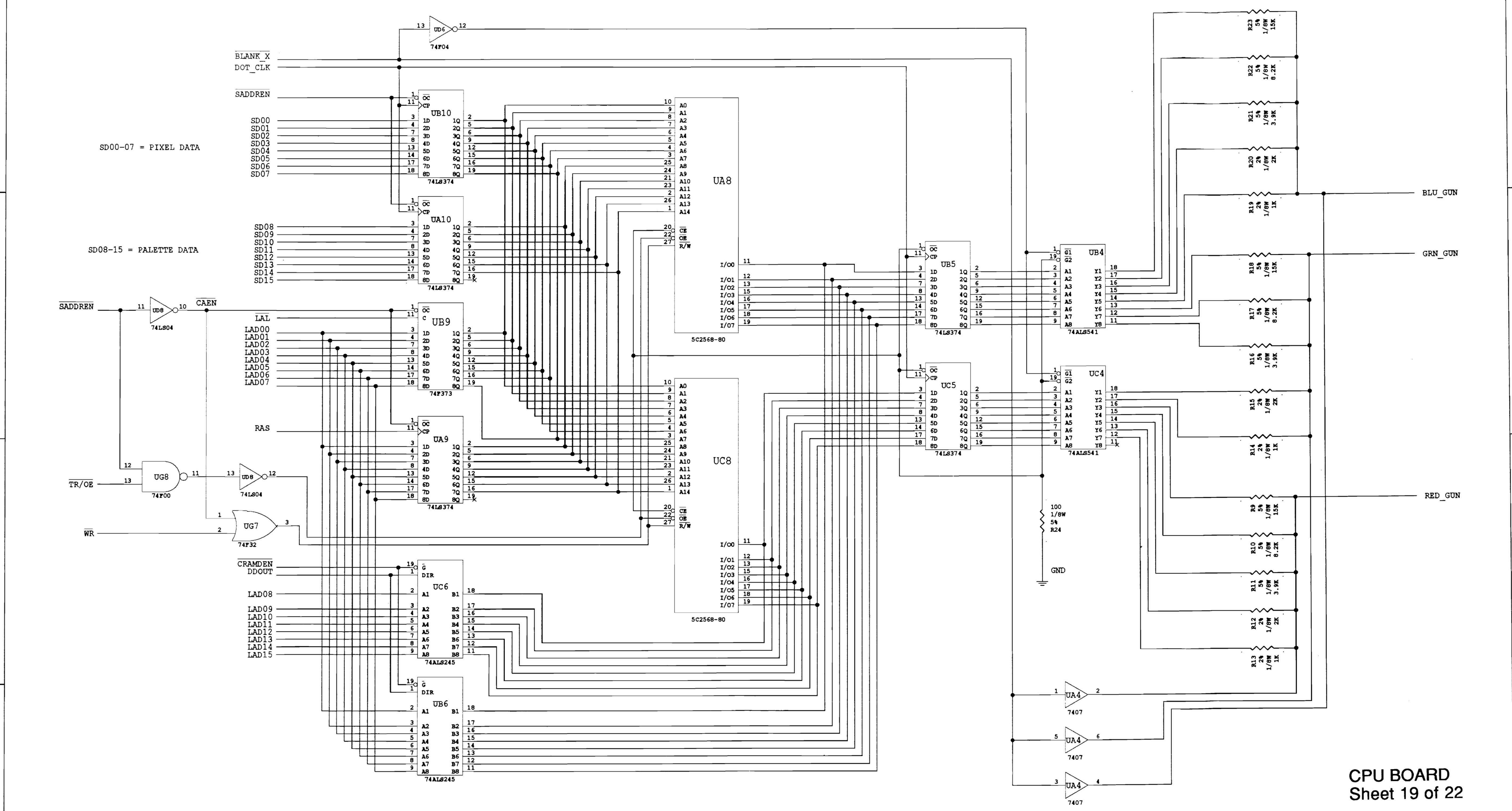
CPU BOARD
Sheet 17 of 22

INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.	
PROJECT ENG. REM — FIRST PROJ. NO 40023 — DATE 09DEC92	WILLIAMS ELECTRONICS AND GAMES INC. MIDWAY MANUFACTURING COMPANY 3401 N. CALIFORNIA AVE. CHICAGO IL.
DWN. BY REM — DATE — FIRST USEAGE A-14816 — DATE 09DEC92	TITLE PLAYER 3/PLAYER 4 INPUTS
CHECKED REM — DATE — CURRENT PROJECT 40023 — DATE 19AUG93	
APPROVED — DATE — SHEET 17 OF 22	PART NO. 16-9470 — REV. 5



CPU BOARD
Sheet 18 of 22

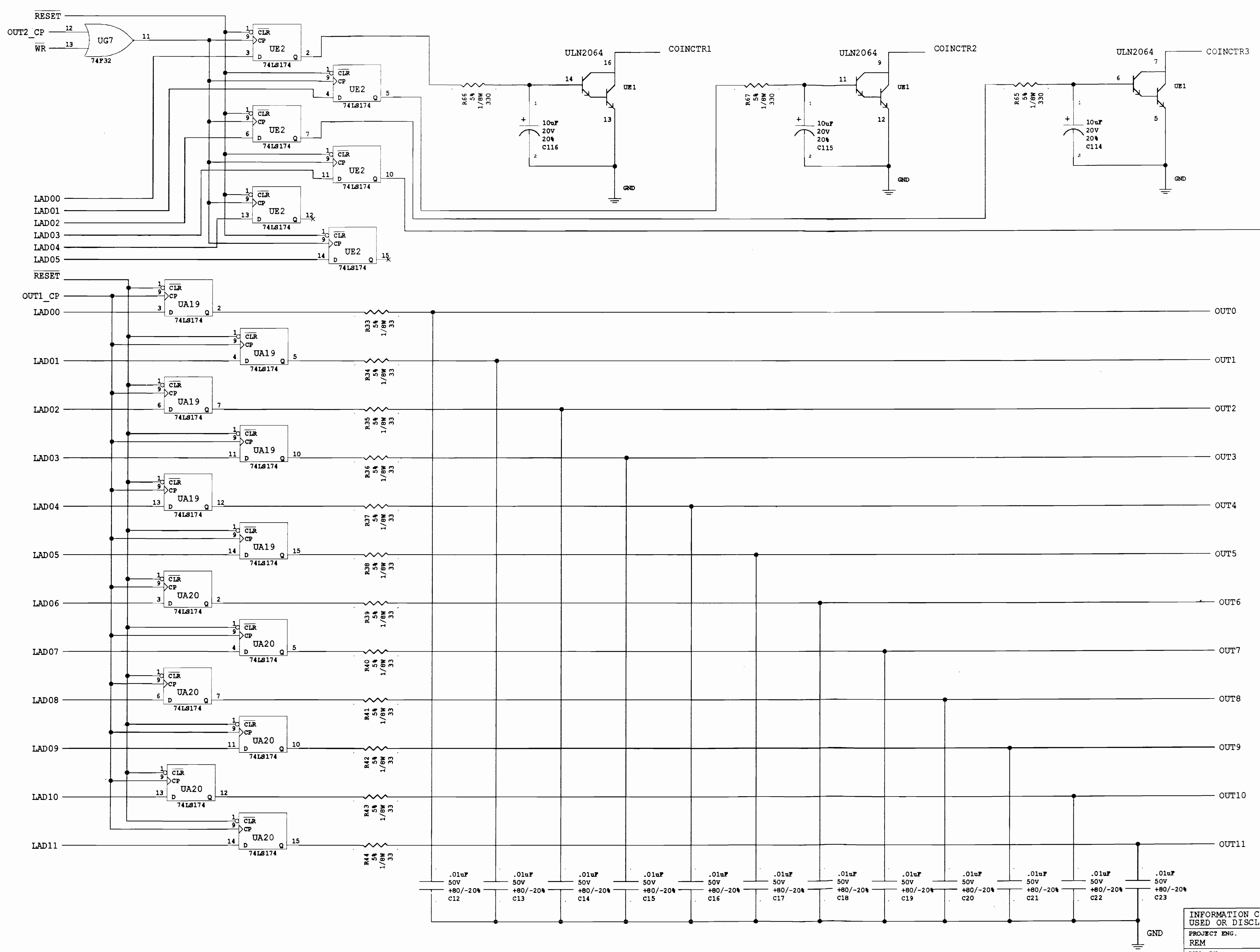
PROJECT ENG. REM	FIRST PROJ. NO 40023	DATE 09DEC92	WILLIAMS ELECTRONICS AND GAMES INC. MIDWAY MANUFACTURING COMPANY 3401 N. CALIFORNIA AVE. CHICAGO IL.
DWN. BY REM	FIRST USEAGE A-14816	DATE 09DEC92	TITLE A/D
CHECKED REM	CURRENT PROJECT 40023	DATE 19AUG93	
APPROVED	SHEET 18 OF 22		PART NO. 16-9470 REV. 5



CPU BOARD
Sheet 19 of 22

19 AUG. 1993 REM - CHANGED UG7 74LS32 TO 74F32.

PROJECT ENG.		FIRST PROJ. NO	DATE	WILLIAMS ELECTRONICS AND GAMES INC.
REM		40023	09DEC92	MIDWAY MANUFACTURING COMPANY
DWN. BY	DATE	FIRST USEAGE	DATE	3401 N. CALIFORNIA AVE. CHICAGO IL.
REM		A-14816	09DEC92	TITLE
CHECKED	DATE	CURRENT PROJECT	DATE	RAMDAC
REM		40023	19AUG93	
APPROVED	DATE	SHEET 19	OF	PART NO. 16-9470 REV. 5

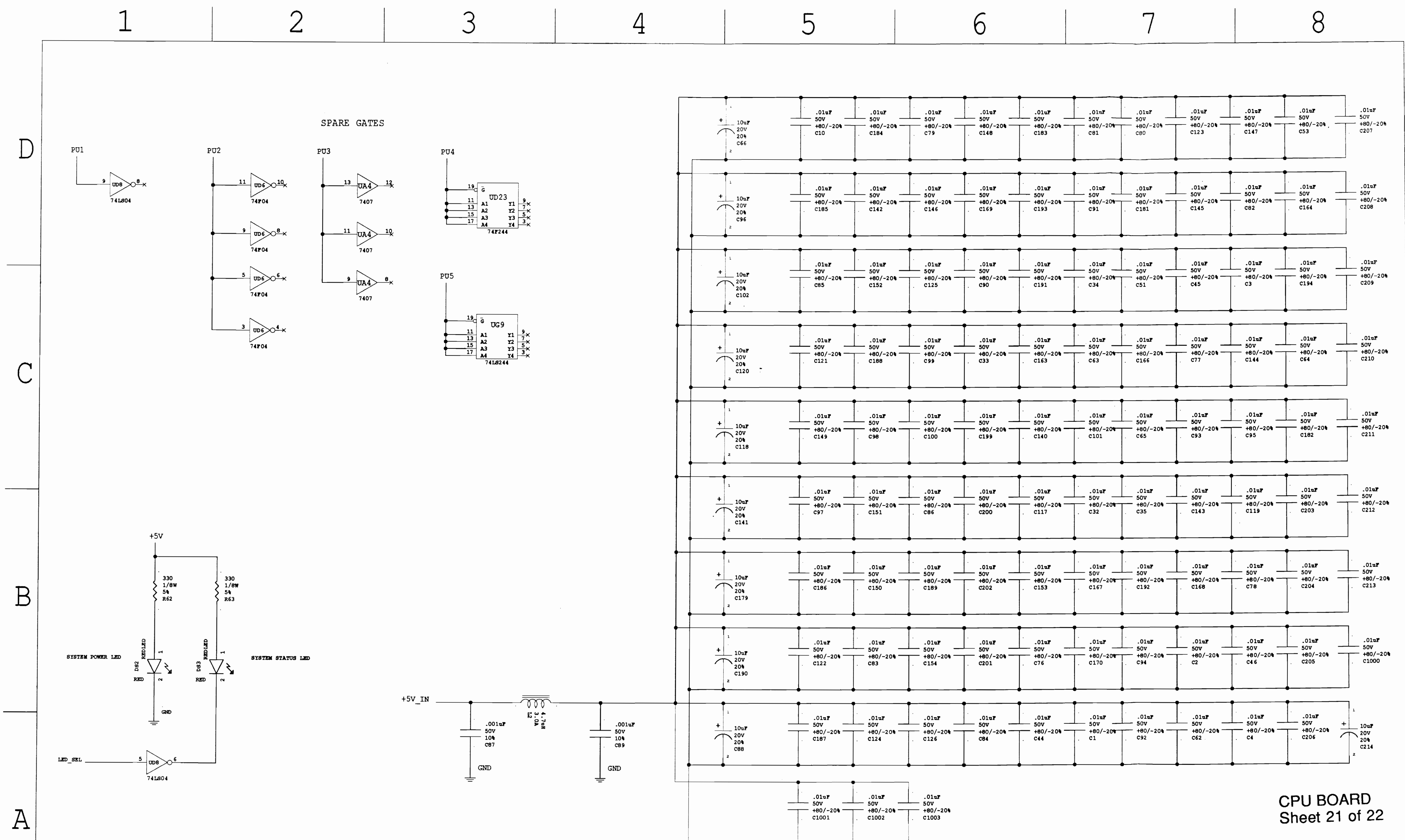


CPU BOARD
Sheet 20 of 22

19 AUG. 1993 REM - CHANGED UG7 74LS32 TO 74F32.

INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.

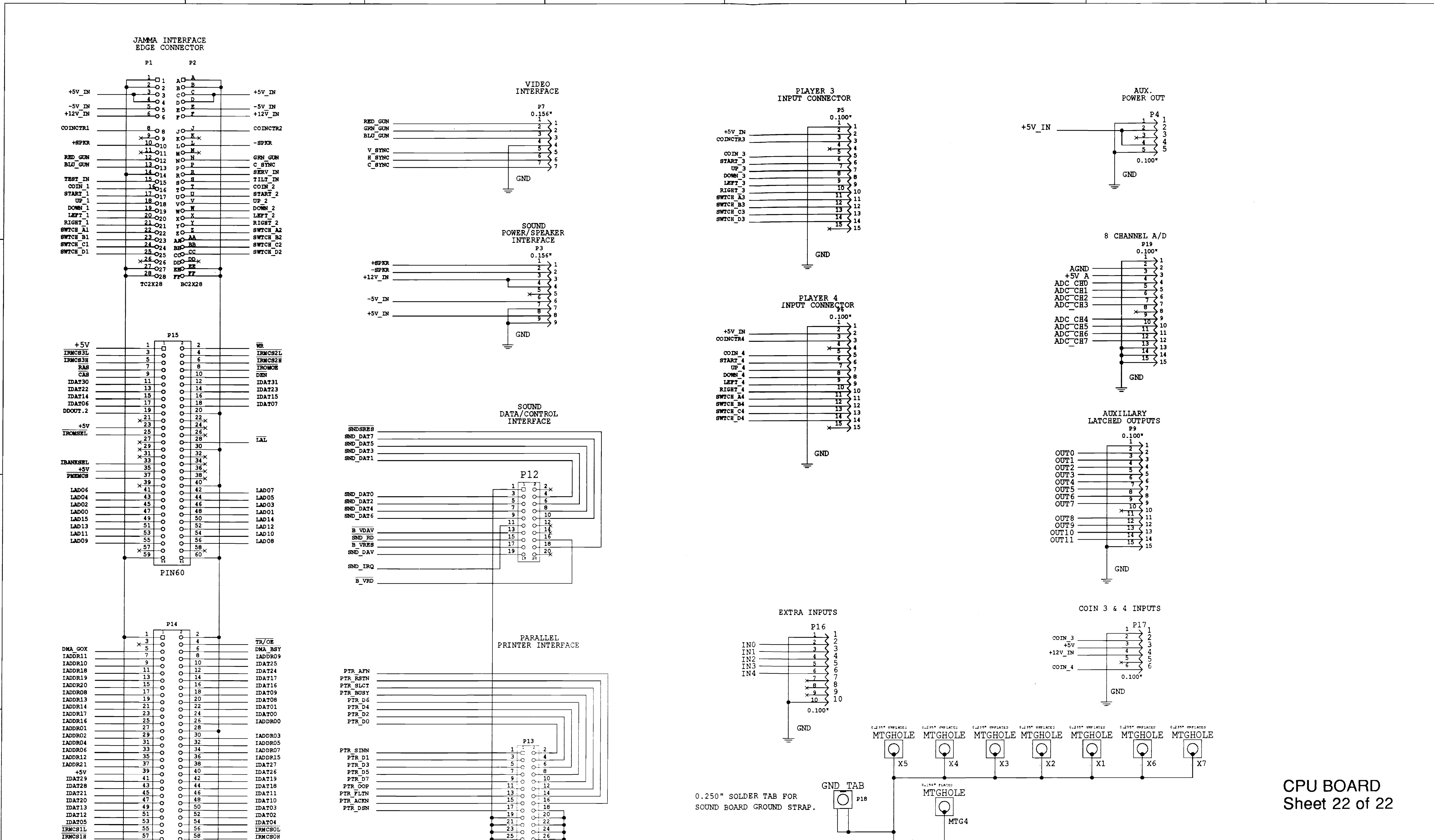
PROJECT ENG.		FIRST PROJ. NO	DATE	WILLIAMS ELECTRONICS AND GAMES INC. MIDWAY MANUFACTURING COMPANY 3401 N. CALIFORNIA AVE. CHICAGO IL.
REM		40023	09DEC92	
DWN. BY	DATE	FIRST USEAGE	DATE	
REM		A-14816	09DEC92	TITLE OUTPUTS
CHECKED	DATE	CURRENT PROJECT	DATE	
REM		40023	19AUG93	
APPROVED	DATE	SHEET 20	OF 22	PART NO. 16-9470 REV. 5



25 MAY 1993 REM - ADDED C1001, C1002, C1003

INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.

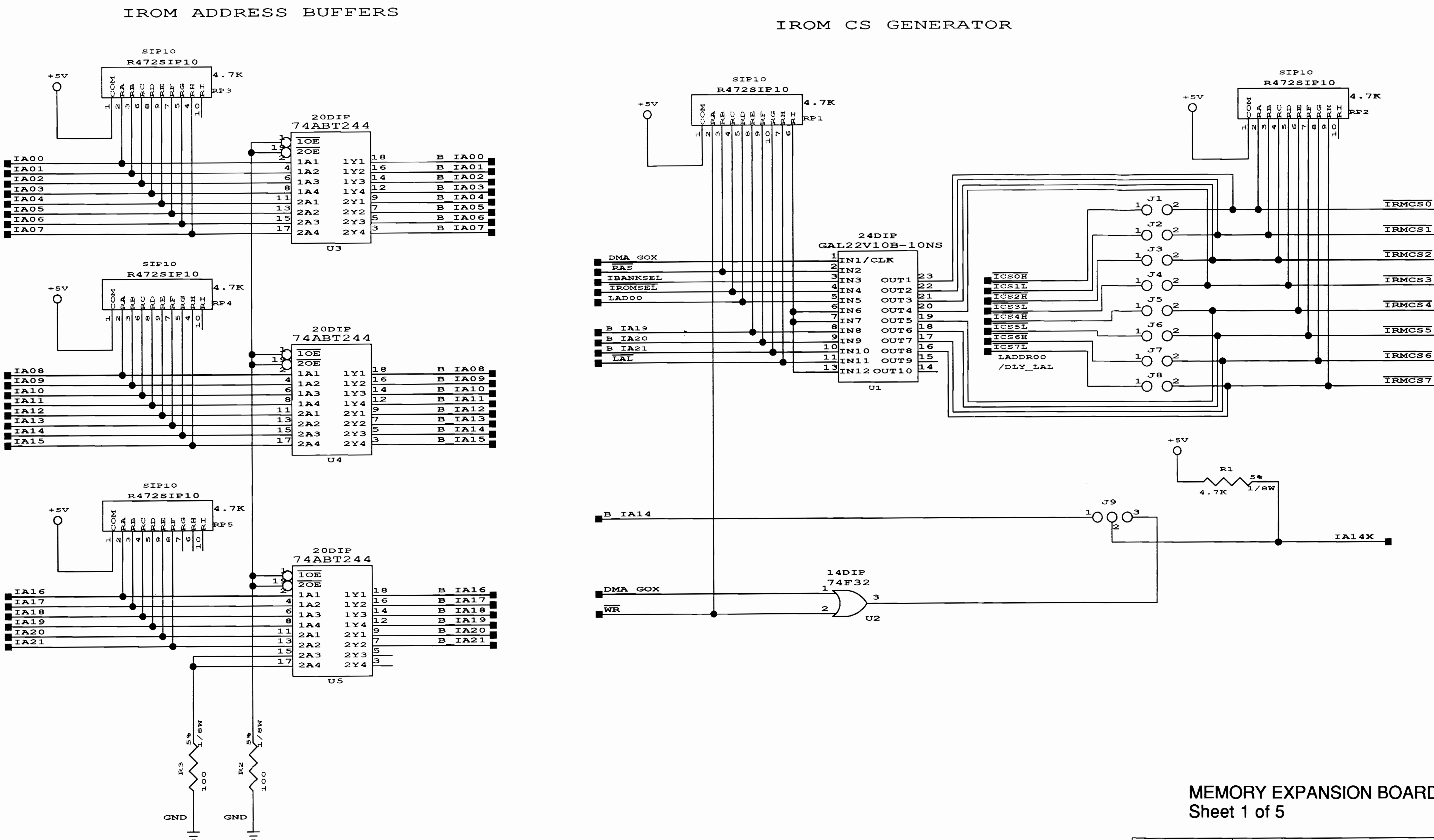
PROJECT ENG. REM	FIRST PROJ. NO 40023	DATE 09DEC92	WILLIAMS ELECTRONICS AND GAMES INC. MIDWAY MANUFACTURING COMPANY 3401 N. CALIFORNIA AVE. CHICAGO IL.
DWN. BY REM	DATE	FIRST USEAGE A-14816 DATE 09DEC92	TITLE POWER
CHECKED REM	DATE	CURRENT PROJECT 40023 DATE 19AUG93	
APPROVED	DATE	SHEET 21 OF 22	PART NO. 16-9470 REV. 5



CPU BOARD
Sheet 22 of 22

25 MAY 1993 REM - ADDED PWR, GND, IROMSEL~, & IBANKSEL TO P14 & P15.

PROJECT ENG. REM	FIRST PROJ. NO 40023	DATE 09DEC92	WILLIAMS ELECTRONICS AND GAMES INC. MIDWAY MANUFACTURING COMPANY 3401 N. CALIFORNIA AVE. CHICAGO IL.
DWN. BY REM	FIRST USEAGE A-14816	DATE 09DEC92	TITLE CONNECTORS
CHECKED REM	CURRENT PROJECT 40023	DATE 19AUG93	
APPROVED	SHEET 22 OF 22		PART NO. 16-9470 REV. 5

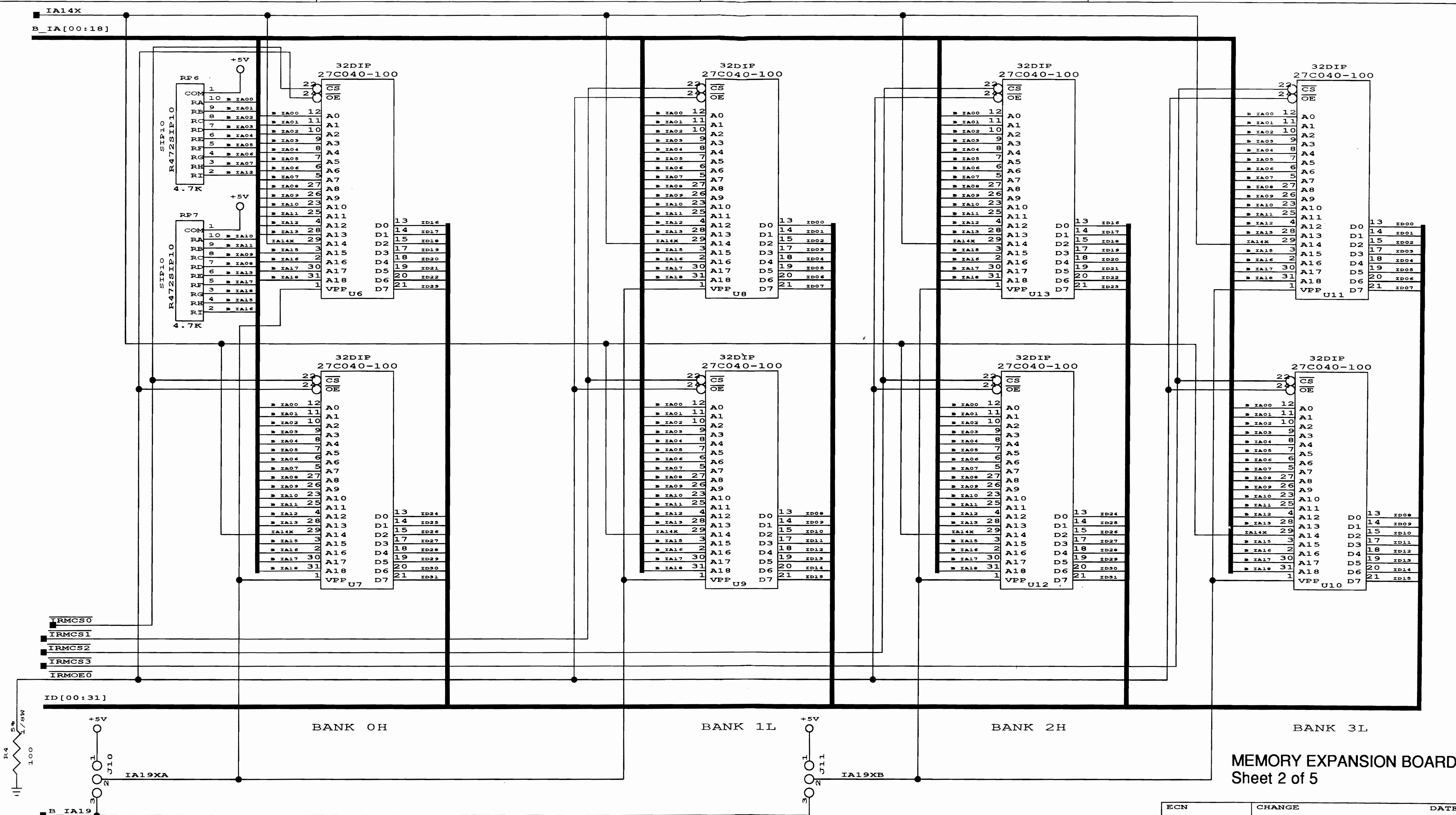


MEMORY EXPANSION BOARD
Sheet 1 of 5

ECN	CHANGE	DATE

INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.

PROJECT ENG.	1ST PROJ. NO. DATE	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA
DWN. BY DATE REM 8-20-1993_6:34	1ST USEAGE DATE	TITLE 13664-01 PLD/CONTROL & IA BUFFERS
CHECKED DATE	CURRENT PROJ. DATE	
APPROVED DATE	SHEET 1 OF 5	PART NO. REV. 1

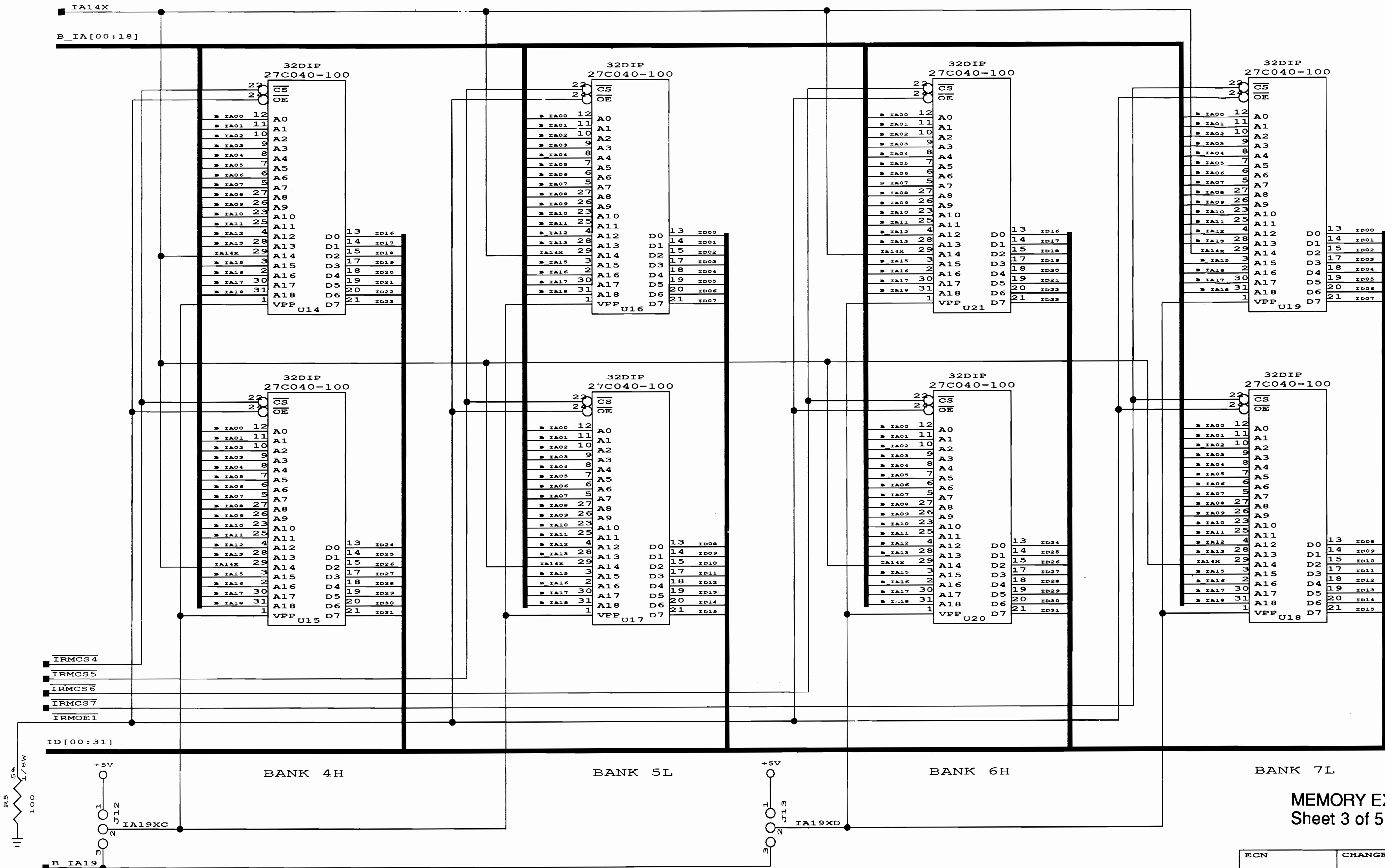


Jumper J10 & J11 pins 1-2 for 4 Mbit EPROM.
Jumper J10 & J11 pins 2-3 for 8 Mbit EPROM.
Green wire J10 & J11 pins 2 to B_IA14 for 4 Mbit RAM.

MEMORY EXPANSION BOARD
Sheet 2 of 5

ECN	CHANGE	DATE

PROJECT ENG.	1ST PROJ. NO. DATE	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA
DWN. BY DATE REM 7-26-1993_15:15	1ST USEAGE DATE	TITLE 13664-01 IMAGE ROM BANK 0/BANK 1
CHECKED DATE	CURRENT PROJ. DATE	
APPROVED DATE	SHEET 2 OF 5	PART NO. REV. 1



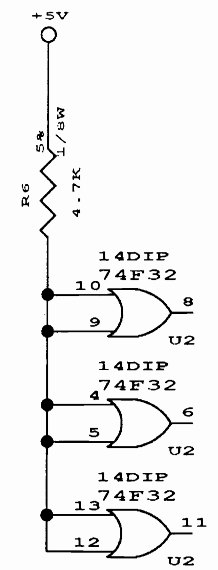
Jumper J12 & J13 pins 1-2 for 4 Mbit EPROM.
Jumper J12 & J13 pins 2-3 for 8 Mbit EPROM.
Green wire J12 & J13 pins 2 to B_IA14 for 4 Mbit RAM.

MEMORY EXPANSION BOARD
Sheet 3 of 5

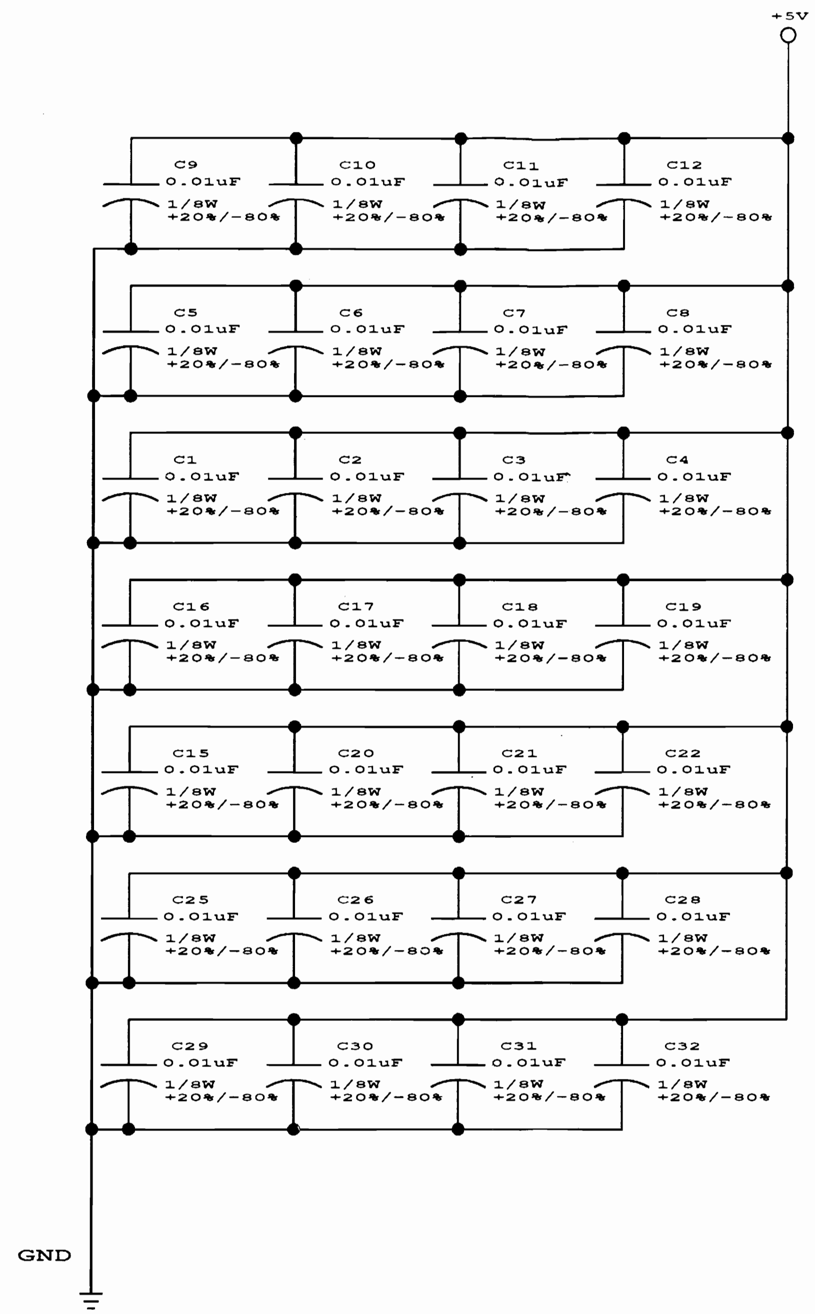
ECN	CHANGE	DATE

PROJECT ENG.	1ST PROJ. NO. DATE	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA
DWN. BY DATE REM 7-26-1993_15:15	1ST USEAGE DATE	TITLE 13664-01 IMAGE ROM BANK 0/BANK 1
CHECKED DATE	CURRENT PROJ. DATE	
APPROVED DATE	SHEET 3 OF 5	PART NO. REV. 1

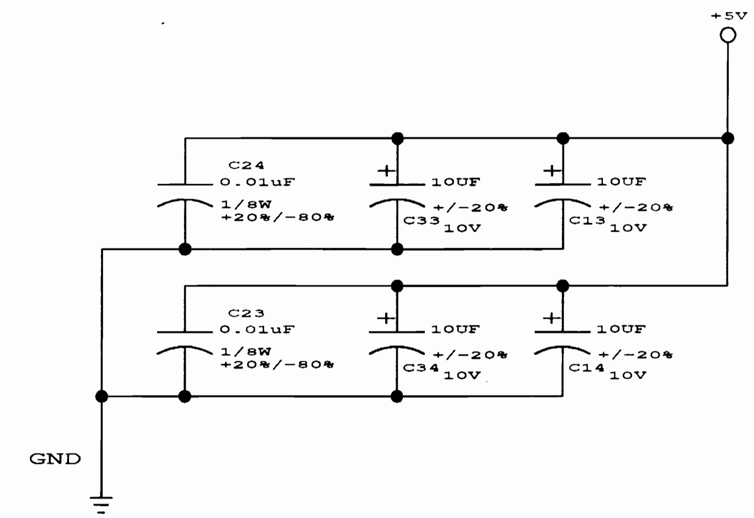
SPARE GATES



BYPASS CAPS



FILTER CAPS



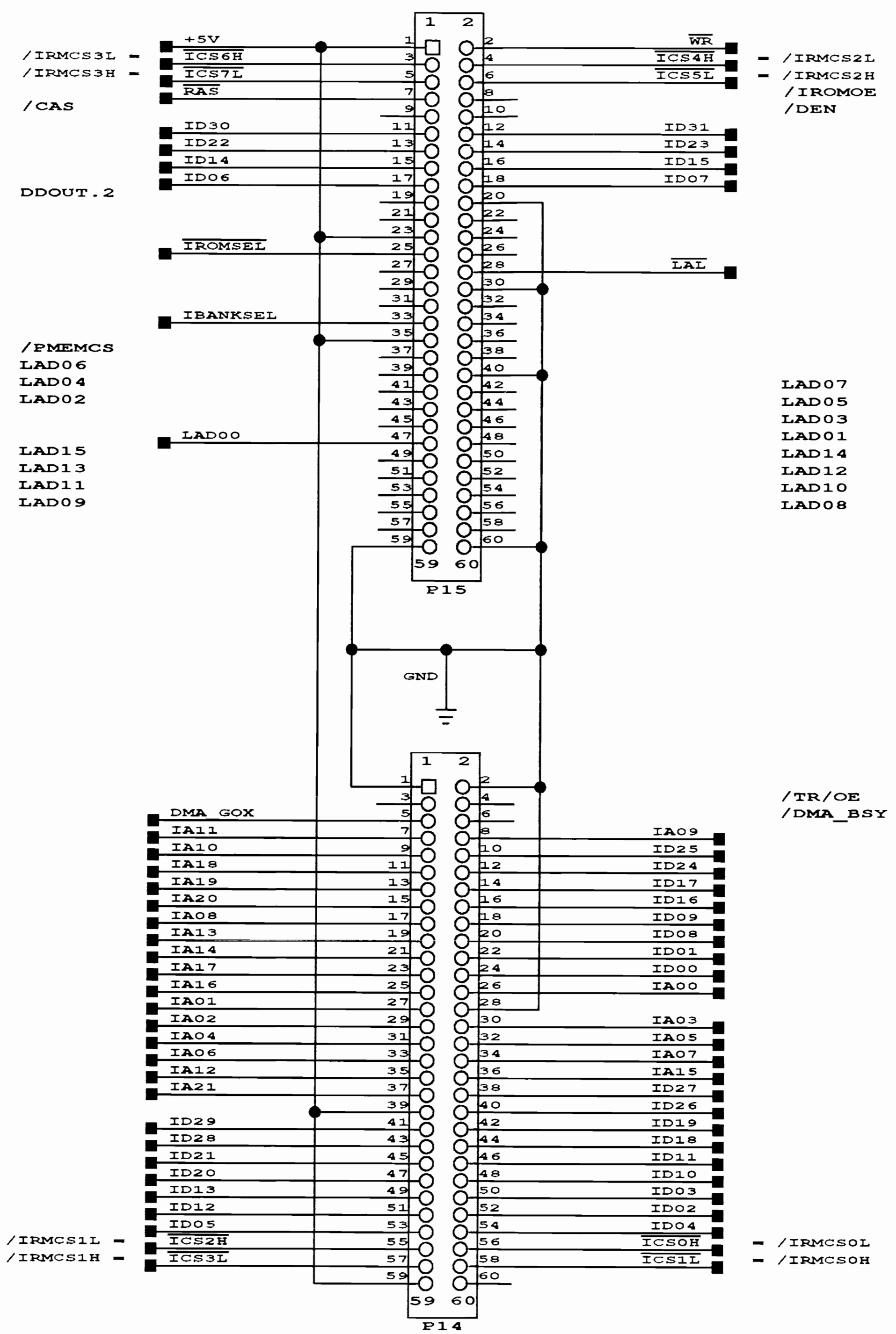
MEMORY EXPANSION BOARD
Sheet 4 of 5

ECN	CHANGE	DATE

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PROJECT ENG.	1ST PROJ. NO. DATE	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA
DWN. BY DATE REM 7-26-1993_15:15	1ST USEAGE DATE	TITLE 13664-01 CAPS/SPARE GATES
CHECKED DATE	CURRENT PROJ. DATE	
APPROVED DATE	SHEET OF 5	PART NO. REV. 1

T-UNIT EXPANSION CONNECTORS

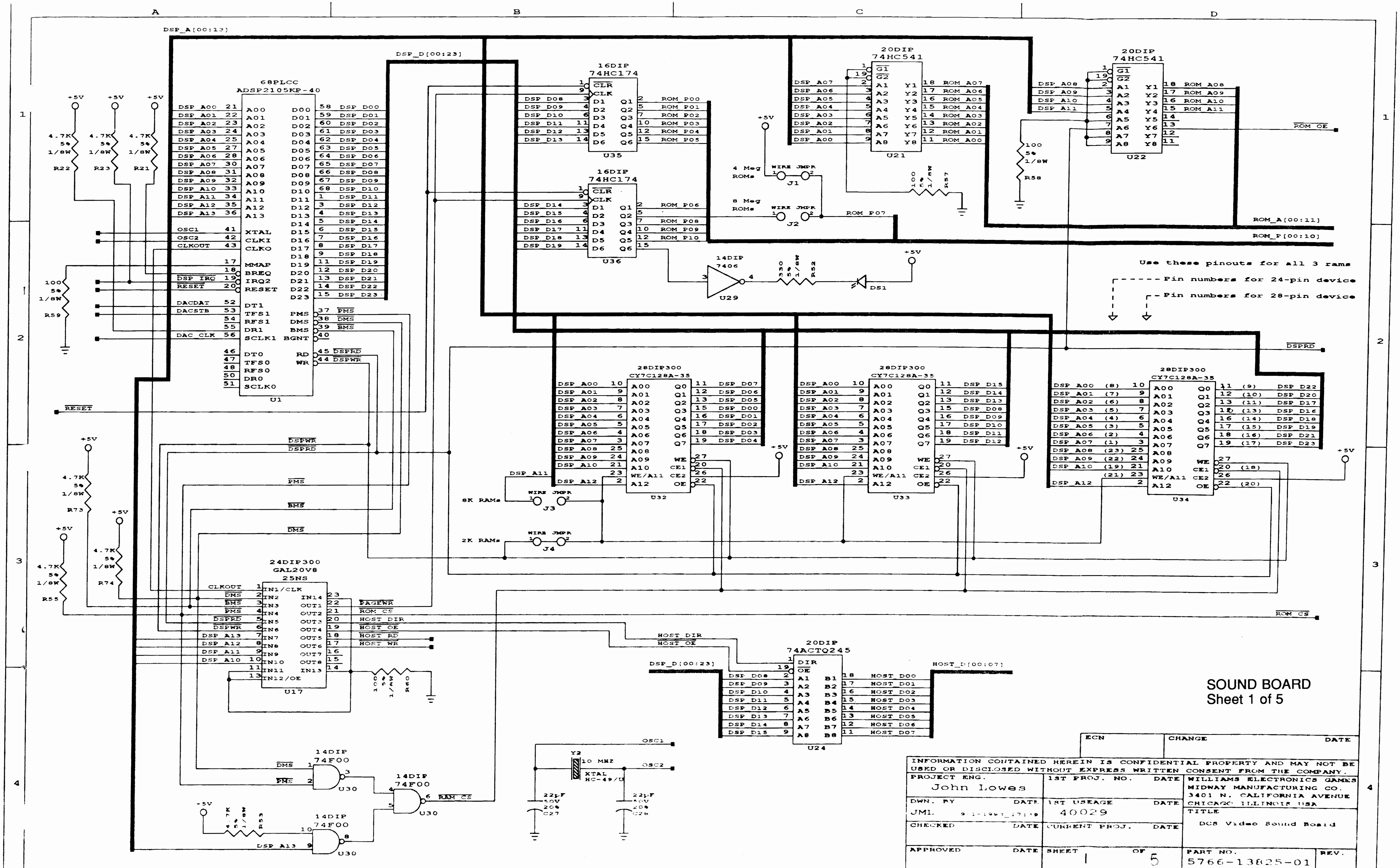


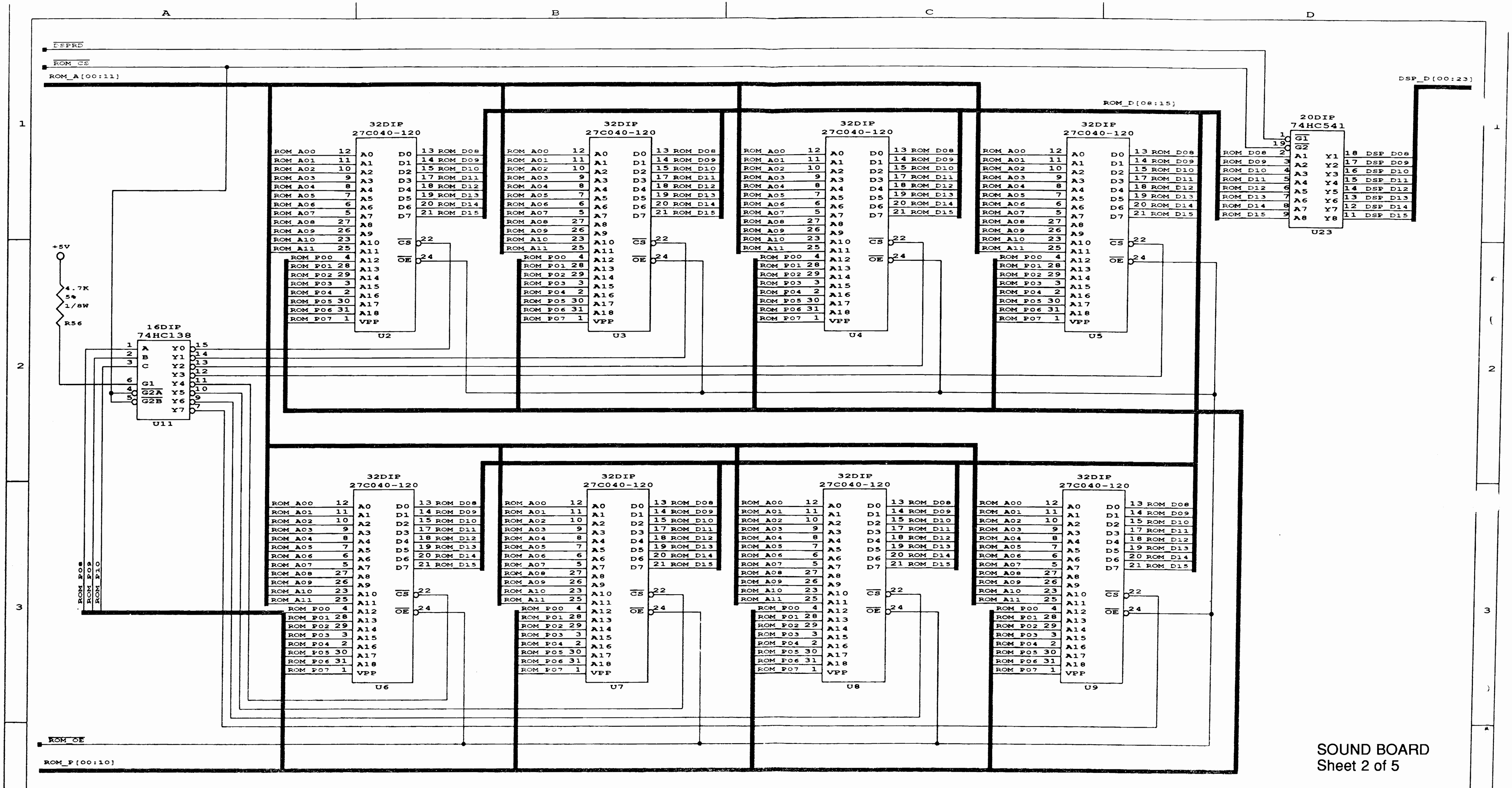
TUNIT CPU BOARD	-	EXPANSION CARD		
/IRMCS0L	-	/ICS0H	-	/IRMSC0
/IRMCS0H	-	/ICS1L	-	/IRMSC1
/IRMCS1L	-	/ICS2H	-	/IRMSC2
/IRMCS1H	-	/ICS3L	-	/IRMSC3
/IRMCS2L	-	/ICS4H	-	/IRMSC4
/IRMCS2H	-	/ICS5L	-	/IRMSC5
/IRMCS3L	-	/ICS6H	-	/IRMSC6
/IRMCS3H	-	/ICS7L	-	/IRMSC7

MEMORY EXPANSION BOARD
Sheet 5 of 5

ECN	CHANGE	DATE

PROJECT ENG.	1ST PROJ. NO. DATE	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA
DWN. BY DATE REM 7-26-1993_15:15	1ST USEAGE DATE	TITLE 13664-01 EXP. CONNECTORS
CHECKED DATE	CURRENT PROJ. DATE	
APPROVED DATE	SHEET 5 OF 5	PART NO. REV. 1


SOUND BOARD
Sheet 1 of 5
INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.
PROJECT ENG.
John Lowes
1ST PROJ. NO.
DATE
WILLIAMS ELECTRONICS GAMES
MIDWAY MANUFACTURING CO.
3401 N. CALIFORNIA AVENUE
CHICAGO ILLINOIS USA
DWN. BY
JML
1ST USEAGE
40029
TITLE
DCS Video Sound Board
CHECKED
CURRENT PROJ.
APPROVED
SHEET 1 OF 5
PART NO.
5766-13825-01
REV.
ECN
CHANGE
Use these pinouts for all 3 rams
Pin numbers for 24-pin device
Pin numbers for 28-pin device
68PLCC
ADSP2105KP-40
U1
74HC174
U35
U36
74HC541
U21
U22
CY7C128A-35
U32
U33
U34
GAL20V8
25NS
U17
74ACTQ245
U24
74F00
U30
7406
U29
10 MHZ
XTAL
HC-49/U
DSP_A[00:13]
DSP_D[00:23]
ROM_A[00:11]
ROM_P[00:10]
HOST_D[00:07]
4 Meg ROMs
8 Meg ROMs
8K RAMs
2K RAMs
WIRE JMPR

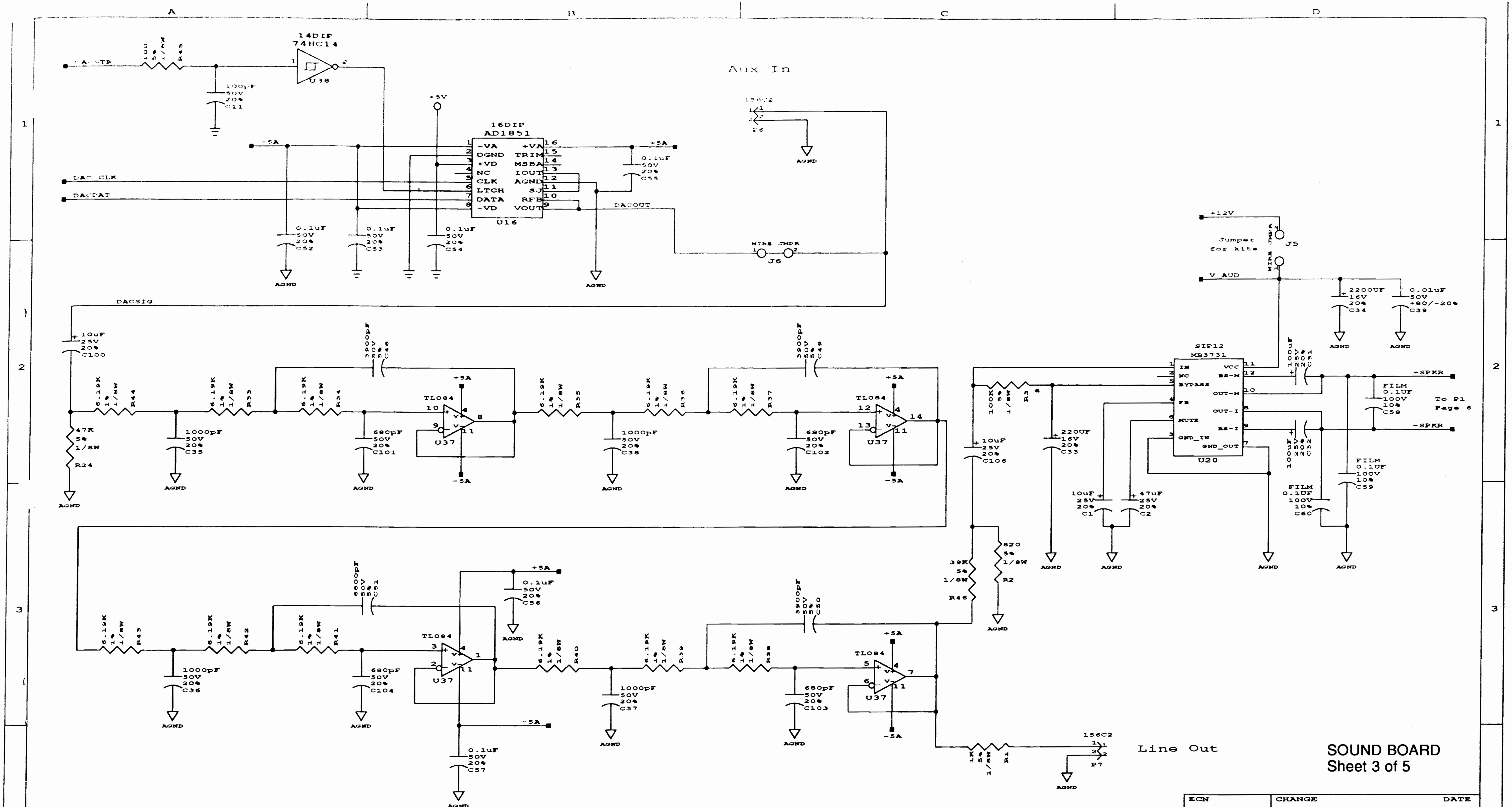


SOUND BOARD
Sheet 2 of 5

ECN	CHANGE	DATE

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PROJECT ENG. John Lowes	1ST PROJ. NO.	DATE	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA
DWN. BY JML DATE 9-1-1993_17:38	1ST USAGE 40029	DATE	TITLE DCS Video Sound Board
CHECKED DATE	CURRENT PROJ.	DATE	
APPROVED DATE	SHEET 2 OF 5		PART NO. 5766-13825-01 REV.

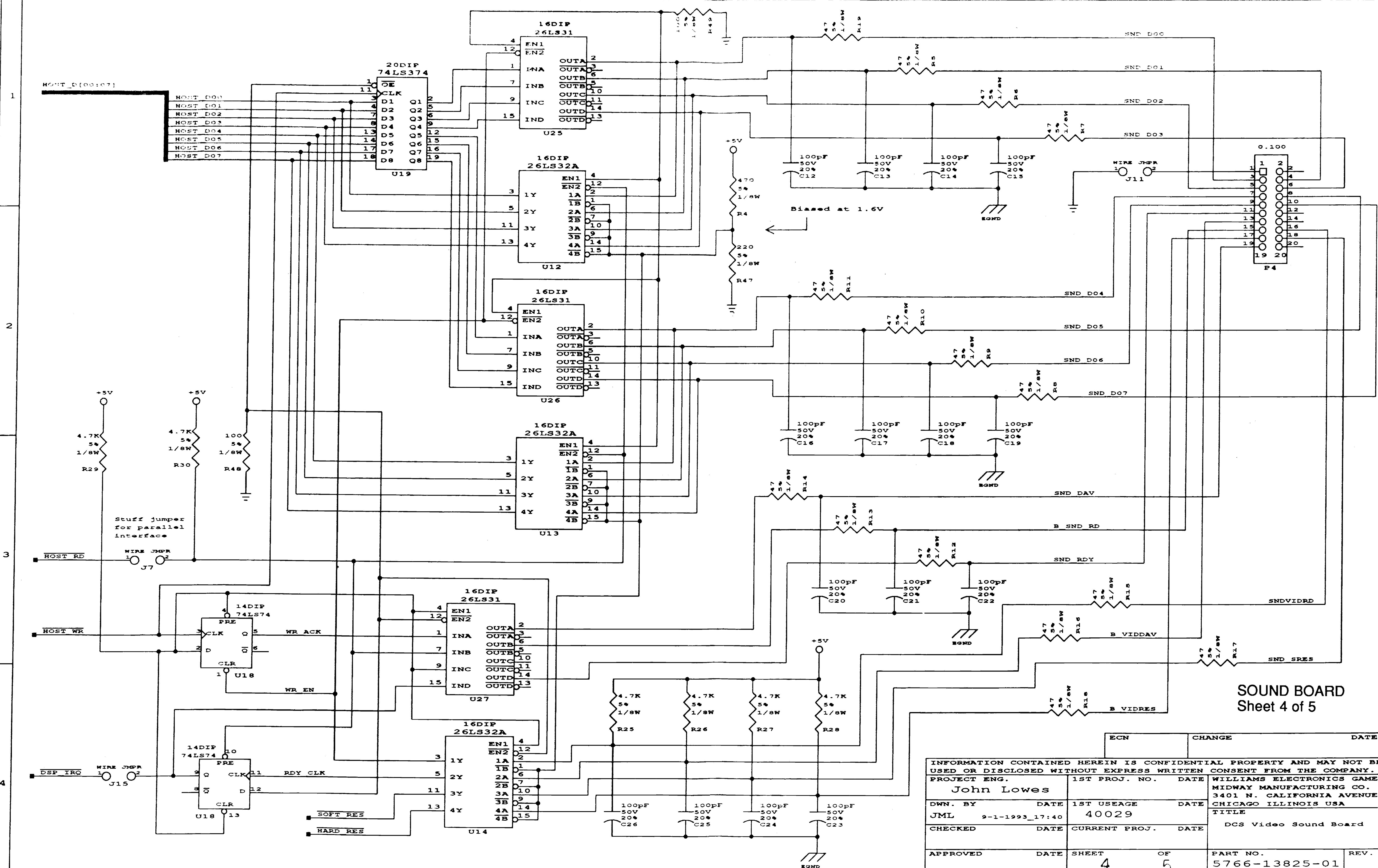


SOUND BOARD
Sheet 3 of 5

ECN	CHANGE	DATE

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PROJECT ENG. John Lowes	1ST PROJ. NO. DATE	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA
DWN. BY JML DATE 9-1-1993_17:39	1ST USEAGE 40029 DATE	TITLE DCS Video Sound Board Anti-Aliasing Filter
CHECKED DATE	CURRENT PROJ. DATE	
APPROVED DATE	SHEET 3 OF 5	PART NO. 5766-13825-01 REV. -

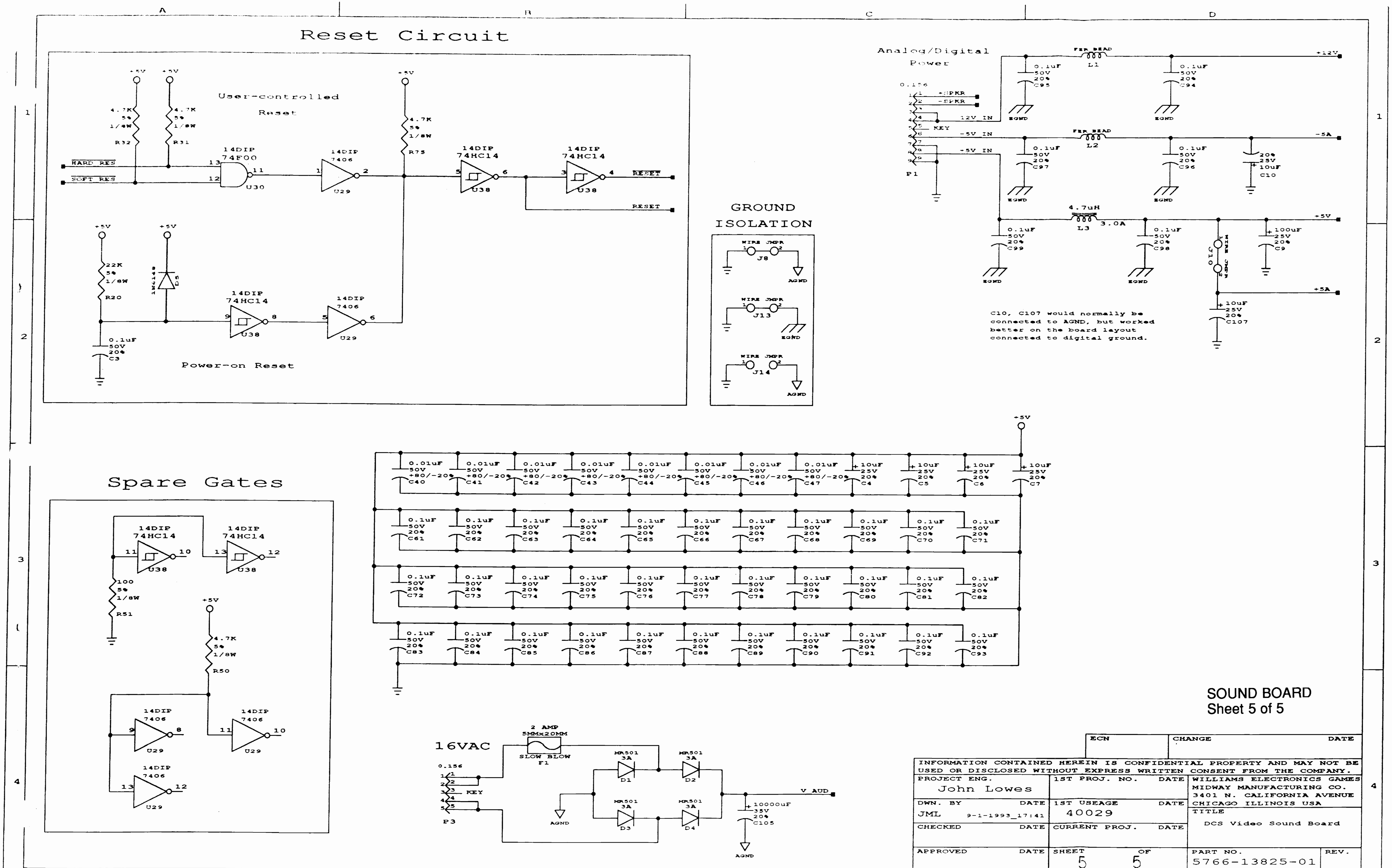


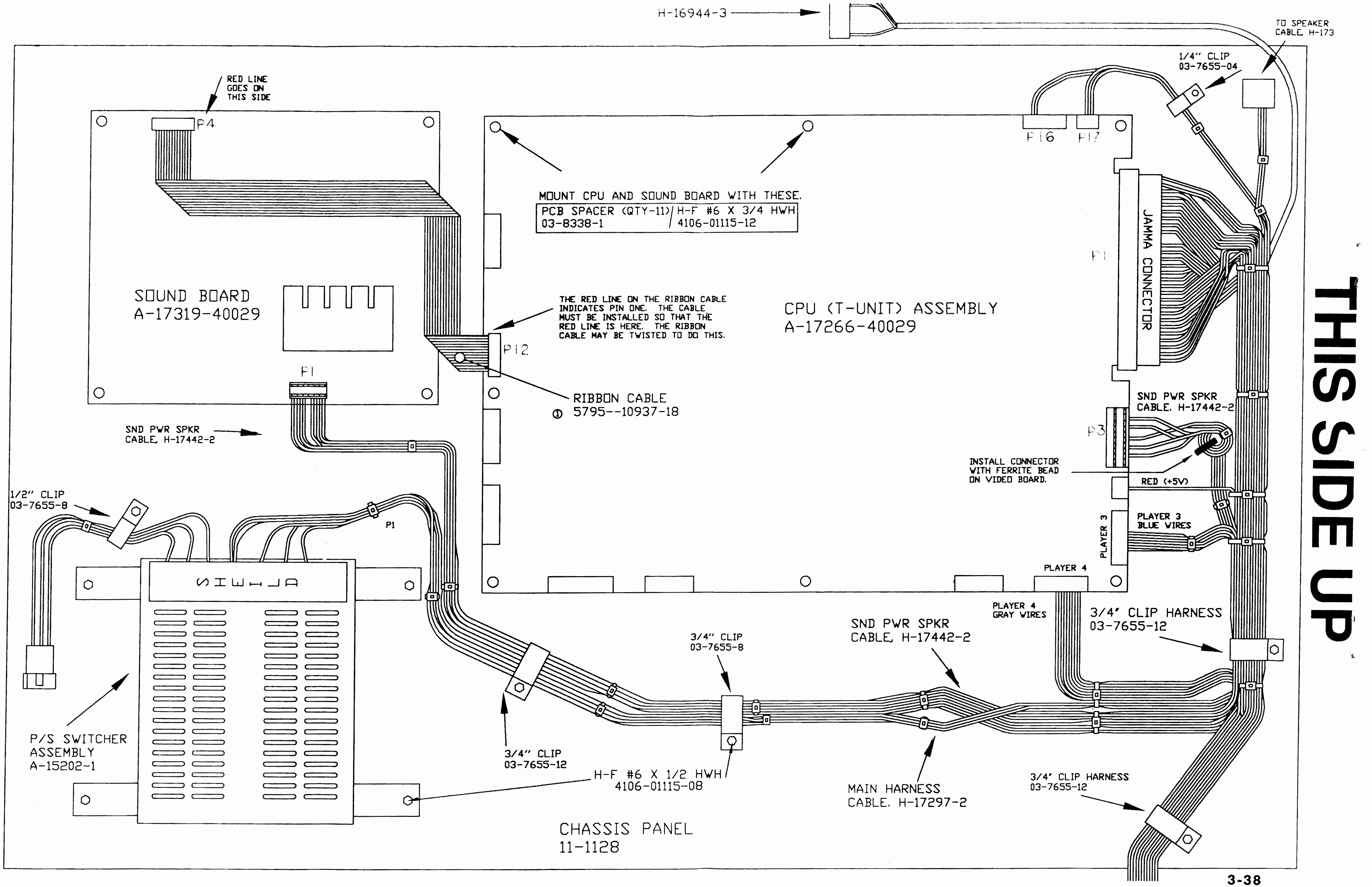
SOUND BOARD
Sheet 4 of 5

ECN	CHANGE	DATE

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PROJECT ENG. John Lowes	1ST PROJ. NO. DATE	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA
DWN. BY JML DATE 9-1-1993_17:40	1ST USEAGE 40029 DATE	TITLE DCS Video Sound Board
CHECKED DATE	CURRENT PROJ. DATE	
APPROVED DATE	SHEET 4 OF 5	PART NO. 5766-13825-01 REV.


Reset Circuit
User-controlled Reset
HARD RES
SOFT RES
14DIP 74F00 U30
14DIP 7406 U29
14DIP 74HC14 U38
RESET
4.7K 5% 1/4W R32
4.7K 5% 1/8W R31
4.7K 5% 1/8W R75
22K 5% 1/8W R20
1N4148 D5
0.1uF 50V 20% C3
Power-on Reset
GROUND ISOLATION
WIRE JMPR J8
WIRE JMPR J13
WIRE JMPR J14
AGND
EGND
Analog/Digital Power
0.156
+SPKR
-SPKR
KEY
12V IN
-5V IN
+5V IN
P1
FER BEAD L1
FER BEAD L2
4.7uH L3 3.0A
+12V
-5A
+5V
+5A
0.1uF 50V 20% C95
0.1uF 50V 20% C94
0.1uF 50V 20% C97
0.1uF 50V 20% C96
20% 25V 10uF C10
0.1uF 50V 20% C99
0.1uF 50V 20% C98
100uF 25V 20% C9
10uF 25V 20% C107
C10, C107 would normally be connected to AGND, but worked better on the board layout connected to digital ground.
Spare Gates
14DIP 74HC14 U38
100 5% 1/8W R51
4.7K 5% 1/8W R50
14DIP 7406 U29
0.01uF 50V +80/-20% C40 C41 C42 C43 C44 C45 C46 C47
10uF 25V 20% C4 C5 C6 C7
0.1uF 50V 20% C61–C93
16VAC
2 AMP 5MMx20MM SLOW BLOW F1
MR501 3A D1 D2 D3 D4
P3
V AUD
10000uF 35V 20% C105
SOUND BOARD
Sheet 5 of 5
ECN
CHANGE
DATE
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PROJECT ENG. John Lowes
1ST PROJ. NO. DATE
WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA
DWN. BY JML DATE 9-1-1993_17:41
1ST USEAGE 40029 DATE
TITLE DCS Video Sound Board
CHECKED DATE
CURRENT PROJ. DATE
APPROVED DATE
SHEET 5 OF 5
PART NO. 5766-13825-01
REV.


H-16944-3
TO SPEAKER CABLE H-173
1/4" CLIP 03-7655-04
RED LINE GOES ON THIS SIDE
P4
P16
P17
MOUNT CPU AND SOUND BOARD WITH THESE.
PCB SPACER (QTY-11) 03-8338-1
H-F #6 X 3/4 HWH 4106-01115-12
JAMMA CONNECTOR
P1
SOUND BOARD A-17319-40029
THE RED LINE ON THE RIBBON CABLE INDICATES PIN ONE. THE CABLE MUST BE INSTALLED SO THAT THE RED LINE IS HERE. THE RIBBON CABLE MAY BE TWISTED TO DO THIS.
CPU (T-UNIT) ASSEMBLY A-17266-40029
P12
P1
RIBBON CABLE ① 5795--10937-18
SND PWR SPKR CABLE H-17442-2
SND PWR SPKR CABLE H-17442-2
P3
INSTALL CONNECTOR WITH FERRITE BEAD ON VIDEO BOARD.
RED (+5V)
1/2" CLIP 03-7655-8
P1
PLAYER 3 BLUE WIRES
PLAYER 3
PLAYER 4
PLAYER 4 GRAY WIRES
3/4" CLIP HARNESS 03-7655-12
SND PWR SPKR CABLE H-17442-2
3/4" CLIP 03-7655-8
P/S SWITCHER ASSEMBLY A-15202-1
3/4" CLIP 03-7655-12
H-F #6 X 1/2 HWH 4106-01115-08
MAIN HARNESS CABLE H-17297-2
3/4" CLIP HARNESS 03-7655-12
CHASSIS PANEL 11-1128
THIS SIDE UP

Control Panel Wire Colors

Player One

Start	White
Up (Jump)	White-Black
Down (Duck)	White-Brown
Left (Move)	White-Red
Right (Move)	White-Orange
High Punch	White-Yellow
Block	White-Green
High Kick	White-Blue
Low Punch	Blue-Black
Low Kick	Blue-Brown
Ground	Black

Player Two

Start	Violet-White
Up (Jump)	Violet-Black
Down (Duck)	Violet-Brown
Left (Move)	Violet-Red
Right (Move)	Violet-Orange
High Punch	Violet-Yellow
Block	Violet-Green
High Kick	Violet-Blue
Low Punch	Blue-Black
Low Kick	Blue-Brown
Ground	Black

PC Board Jumpers

CPU Board

J18, J19, J22, J24 J28, J154	0Ω Resistor, 1/4W

Sound Board

J5, J8, J10, J13	Wire Insulated Jumper
J1, J4, J6, J7, J15	0Ω Resistor, 1/4W

WARNINGS & NOTICES

Warning
USE OF NON-MIDWAY PARTS OR CIRCUIT MODIFICATIONS MAY CAUSE SERIOUS INJURY OR EQUIPMENT DAMAGE! USE ONLY MIDWAY AUTHORIZED PARTS.
* For safety and reliability, substitute parts and modifications are not recommended.
* Substitute parts or modifications may void FCC type acceptance.
* This game is protected by federal copyright, trademark and patent laws. Unauthorized modifications may be illegal under Federal law. This also applies to MIDWAY logos, designs, publications and assemblies. Moreover, facsimiles of MIDWAY equipment (or any feature thereof) may be illegal under federal law, regardless of whether or not such facsimiles are manufactured with MIDWAY components.

Warning
Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generated, uses and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Warning
Prevent shock hazard and assure proper game operation. Only plug this game into a properly grounded outlet. Do not use a cheater plug to defeat the power cord's grounding pin. Do not cut off the ground pin.

Notice
When MIDWAY ships a game, it is in compliance with FCC regulations. Your sticker is proof. If the sticker is missing or damaged, legal repercussions to the owner or distributor of the game may result. If your game does not contain an FCC sticker, call MIDWAY immediately.

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